Qualification & Education in Digital Curation: the nestor Experience in Germany

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ABSTRACT

Being a relatively new topic in research and education, digital curation is, for a number of reasons, currently not very well covered by university curricula. Within the project "nestor", a transnational partnership of academic institutions in Germany, Switzerland, and Austria, has established a comprehensive qualification program not only based on e-learning tutorials but also on schools, seminars and an (open access) encyclopedia in digital curation.

Categories and Subject Descriptors

K.6.1 [**Management of Computing and Information Systems**]: Project and People Management –*Training*.

Keywords

Digital long term preservation, digital curation, education, further education, nestor, qualification.

1. DIGITAL CURATION: A CHALLENGE FOR EVERY MODERN SOCIETY

In 2006, German experts, institutions, and societies agreed the principles in "Memorandum on the long-term accessibility of digital information in Germany"; abbreviated as "nestor – memorandum"[1] which provides a political state of the art overview and offers perspectives for further activities on digital curation in Germany:

[1]See the text at

http://www.langzeitarchivierung.de/downloads/memo2006-e.pdf

"Digital information has become an integral part of our cultural and scientific heritage. We are increasingly confronted with scientific findings, historical events and cultural achievements presented in electronic form. (...)

Preservation of the digital heritage requires additional and sustained effort on the part of the policy makers, authors, publishers, hard and software manufacturers, and the cultural and scientific memory organisations.

The necessary framework conditions for this should be anchored in the national long-term preservation policy. This should contain intelligent strategies for preserving the knowledge manifested in digital objects, and recommend measures for their long-term preservation and accessibility in the form of a sustainable science and research policy."[2]

Germany - like other countries in the EU facing this challenge - has created an umbrella of projects and activities on long-term preservation. Qualification issues are becoming an integral part of this umbrella.

2. EDUCATION AND QUALIFICATION CHALLENGES IN GERMANY

Born digital objects as well as those that are retrodigitized are a relevant part of collections in institutions such as libraries, archives and museums. These cultural heritage institutions have come to the attention of the EU, the German Federal Ministry of Research and Science, the German Research Foundation and other organizations in Germany.

The virtual headquarters of German activities is the website of the well-known German project nestor (nestor - Network of Expertise in Long-Term Storage of Digital Resources)[3].

The nestor project is two-phased. Its first phase (2003-2006) resulted in several basic documents such as the Memorandum cited above. Its second phase (2006-2009) is based on several work packages realized by working groups (WG).

These are

[2] ibid.

[3] See: http://www.digitalpreservation.de

- WG "Trusted Repositories – Certification"
- WG "Media"
- WG "Long-term preservation standards"
- WG "Cooperative long-term preservation"
- WG "eScience/Grid and digital curation"
- Work Package "Cooperation with universities in qualification"

The nestor-memorandum is a future oriented and promising framework for the preservation of the digital cultural heritage in Germany. In paragraph 18, the nestor-memorandum focuses on qualifications.

> *18. Long-term digital preservation generates new tasks for the preserving institutions. Professionally trained staff must be used. The requirements and tasks of long-term digital preservation need to be given appropriate attention in the initial and further training programmes. Specific training courses need to be set up which sensitise their participants to specific topic areas and which also qualify them to perform the tasks at hand.*

Göttingen State and University Library (SUB) initiated a working group "Cooperation with Universities in qualification" when the second project period of nestor was begun. The WG brings together participants from several cooperating universities as well as other institutions involved in the qualification of information professionals. Meanwhile, the cooperation has been expanded to institutions in Switzerland and Austria, adding further experience and insights from those German speaking countries. The partners in this cooperation are

- Göttingen State and University Library[4] (project coordination)
- Cologne University of Applied Sciences[5], Faculty of Information and Communication Sciences, Institute of Information Science
- Humboldt-Universität zu Berlin - Faculty of Arts I - Institute of Library and Information Science[6]
- Leipzig University of Applied Sciences, Department of Media and Communication[7]
- University of Applied Sciences Marburg (Archivschule Marburg)[8]
- University of Applied Sciences Potsdam, Department of Information Science[9]
- University of Applied Sciences Chur, Switzerland, Information Science[10]

- Vienna University of Technology, Austria, Institute of Software Technology and Interactive Systems, Digital Preservation Group[11]

Although they have different foci, the partners have in common their willingness and commitment to improving the qualification of people involved in digital curation.

3. UNIVERSITY BASED COURSES - A PATCHWORK

3.1 State of the art

A survey on qualification in digital curation at universities must start at the Library and Information Science (LIS) related departments / institutes of universities.

In 2006, Osswald and Scheffel [Osswald/Scheffel 2007] surveyed Bachelor- and Master's programs offered or planned by LIS departments / institutes in the German speaking countries Germany, Austria and Switzerland. In total 16 universities in Berlin, Darmstadt, Düsseldorf, Hamburg, Hannover, Hildesheim, Cologne (2x), Constance, Leipzig, Potsdam, Regensburg, Stuttgart (2x), Chur (CH), Eisenstadt (AU) and Krems (AU) were surveyed.

Teaching staff from each institution complained that none was able to cover the topic completely or to focus on current developments. Specially appointed professors for the field haven't been available and there was (and still is) little likelihood that the entire topic will be assigned to one professorship.

As a consequence, subject-related specialization of those academics involved results in a focus on special topics within the field of digital curation. This provides a good starting point for cooperation among different universities.

3.2 Education & Qualification Programs

3.2.1 Bachelor-programs

Several of the LIS-related BA programs offer various courses related to digital curation. Most of them concentrate on a basic introduction to this field. Some of them take the opportunity to go into more detail in more specialized courses related to preservation or information technology.

Those nine universities that indicated that they deal with the topic focus on it in between 2 and 10 class sessions (each 90 minutes) or devote a whole course to it – many in connection with topics like information management, records management, digital/electronic publishing, archival science or documentation activities in museums.

Topics mentioned in these class sessions / courses:

- Long term preservation of digital data
- Metadata
- Archival repositories / Open Archival Information System

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[4] See: http://www.sub.uni-goettingen.de/index-e.html

[5] See: http://www.fbi.fh-koeln.de/

[6] See: http://www.ibi.hu-berlin.de/

[7] See: http://www.htwk-leipzig.de/english/fbmcenglish/index.htm

[8] See: http://www.archivschule.de

[9] See: http://informationswissenschaften.fh-potsdam.de/

[10] See: http://www.fh-htwchur.ch/Information-Science.17.0.html?&L=1

[11] See: http://www.ifs.tuwien.ac.at/dp/

- Persistent identifiers
- Formats
- Open Access
- Legal issues
- Data protection and archiving.

Within several of the courses, parts of the IMARK (Information Management Resource Kit) modules of UNESCO and/or the Tutorial on Digital Preservation Management of Cornell University have been used – besides other materials and exercises developed by the lecturers themselves.

3.2.2 Master-programs

For obvious reasons, there is a trend to realize an in-depth qualification in digital curation within a MA program. This offers the opportunity to combine existing knowledge in a specific field (subject-related bachelor's degree or a LIS-, archival- or museum-related bachelor's degree) with preservation know-how. Such an additional job related qualification might someday be an obligatory component of management positions.

It is also very likely that such a qualification will be acquired within continuing professional education on a part-time basis. Future developments will show which qualification track will be most suitable to the needs of practitioners.[12]

A program which touches the topic but does not focus only on digital preservation is the four semester MA-program "Conservation of New Media and Digital Information" of the State Academy of Art and Design Stuttgart (Staatliche Akademie der Bildenden Künste Stuttgart)[13] which is designed for members of institutions dealing with modern art. Its objective is:

Imparting knowledge and capabilities about long-term preservation of fine art, cultural, archival and library heritage in the fields of photography, video und digital information.[14]

4. QUALIFICATION NEEDS

Long term preservation of printed and digital objects has been a topic in educational activities at universities for a number of years. Starting with courses in further education related to durability of digital media like floppy disks, CD-ROMs and now DVDs, there is a growing awareness that there are other critical areas as well: availability of application software, operating systems and know-how as well as the persistence of formats, etc. These topics have been picked up within courses at university programs, especially by those dealing with technical aspects of applications in the field of library science, archival science and museology. However, aside from initiatives by some information science departments, no systematic qualification focusing on the topic has taken place up to now.

Therefore, the average librarian or member of an archive has a lack of practical and conceptual knowledge about the topic. Colleagues involved in the nestor project have tried to fill this gap by offering one-day workshops or seminars giving a comprehensive view on the challenges of digital curation. They recorded their presentations and distributed them free of charge on DVD. Nevertheless, the number of practitioners reached was not satisfactory. It was felt that the experts on specific fields could not be hired again and again for events such as this.

When the first period of the nestor project was completed, a workshop was organized by the German National Library in June 2006 titled "Den Fortschritt bewahren" (Keeping progress).[15] One of the presentations focused on the topic "Learning and transfer: Education and further education in the field of long term preservation"[16]. It emphasized the need for a systematic approach to the qualification issue. The authors suggested that courses in the field of digital curation should be differentiated in regard to the target groups as well as to the usage of media and the didactic concept related to it.

After analyzing the situation, it was suggested that at least five target groups should be taken into focus:

- the management of institutions to which curation is or will be a relevant topic by spreading awareness of the challenge to be faced
- middle-management in cultural heritage institutions by providing them state-of-the-art information on concepts and methods of digital curation
- staff members of cultural heritage institutions who are involved in or who are organizing curation activities on an operational level
- BA-students in programs qualifying for jobs in cultural heritage institutions
- MA-students in programs qualifying for projects and management jobs in cultural heritage institutions.

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[12] E.g. in the MA program "European Multimedia, Arts and Cultural Heritage Studies" provided cooperatively by the Universities Cologne (Germany; Prof. Thaller), Coimbra (Portugal), Lecce (Italy) and Turku (Finland) digital curation is supposed to be a topic on which students can stress on. See more at http://www.euromachs.net/.

[13] See for details http://www.mediaconservation.abk-stuttgart.de/home_e.htm

[14] http://www.mediaconservation.abk-stuttgart.de/home_e-Dateien/E_allg.htm. This highly subsidized application oriented program asks for a tuition fee of about 1500 € per term and is very exclusive regarding the number of participants: 12 per year! Experts are hired for presentations and courses (or parts of them) because the broad spectrum of specific know-how is not available by the regular teaching staff. The programme will be evaluated in 2009 and it's continuation is not guaranteed.

[15] See the presentations at http://www.langzeitarchivierung.de/modules.php?op=modload&name=Downloads&file=index&req=viewsdownload&sid=20

[16] By Regine Scheffel, University of Applied Sciences Leipzig and Achim Osswald, Cologne University of Applied Sciences. See the slides (in German): http://www.langzeitarchivierung.de/downloads/nestor_2006_06_19_osswald_scheffel.pdf

5. PROJECT BASED ACTIVITIES

At present there are at least five lines of activities in digital curation-related qualification of the nestor WG "Cooperation with Universities in qualification":

- nestor seminars
- nestor Schools
- the nestor Handbook
- potential development of a cooperative curriculum
- development of e-learning tutorials

5.1 nestor-seminars

The first project period of nestor had no special focus on qualification issues.[17] Nevertheless, those active in nestor realized that there was a need to spread the research results to a community of people interested or involved in the topic. Consequently the results, reports and presentations of the nestor project have been made public. But it seems that only the free provision of information is not the solution of the problem.

Additionally nestor-related researchers set up an activity line called "nestor seminars" (nestor Seminare).[18] Two of them have been recorded on video and distributed on DVD free of charge [SUB / Neuroth 2006].[19] The idea was to multiply knowledge via different means of distribution – including visualization and some personalization (which is provided by seeing the people presenting their slides and speeches on video).

Beside these seminars, the experts gave presentations at conferences and also within university programs – but this could not be done on a systematic basis.

Nevertheless, occasional nestor-related seminars are taking place. They focus on special topics and audiences. For instance, in May 2007, the German National Archive offered a one-day-seminar on the topic of "The role of Open Archival Information System (OAIS) in setting up a digital archive: A helpful guideline for German archives or pure theory?"[20].

As mentioned earlier, this kind of distribution of knowledge is limited especially as to the time that the experts have available. The planning of nestor phase 2 offered the chance to put more concentrated emphasis on the qualification issue.

As a consequence, the nestor-School concept has been further developed. It is influenced by good experiences in DPE and DELOS summer schools[21] and the practical training sessions there. DPE and DELOS are both European projects with a strong focus of qualification and education in digital curation.

Complementary for all those not being able to take part in the School events a Handbook-concept was implemented.

5.2 The nestor Schools

On its qualification website nestor reports:

> *"There will be different events to support the training and education needs. These training events have started with the nestor Spring School 2007 and are continued with workshops and seminars. These ongoing series of events is intended to serve the needs of different communities."[22]*

The nestor Spring School took place in March 2007 in a small and remote village in the eastern part of Germany. The stimulating atmosphere of a former monastery offered an exclusive chance to the about 40 participants to learn more about preservation of digital objects.

nestor Spring School 2007 had the topic "Introduction to digital long term preservation" and lasted five days. Its objective was a basic introduction to the topic, discussion and presentation of solutions and practical training lessons in small groups. Additionally the purpose of the School was the exchange of experiences and networking between different application areas. Slides, protocols and results of the School-event are made available to the participants on a website.

The event was inspired and supported financially by Digital Preservation Europe (DPE)[23] and DELOS, the "Network of Excellence on Digital Libraries" which is funded by the European Commission in the frame of the Information Society Technologies Programme (IST).[24]

Participants received a certificate signed by the organizers and lectures of the School-event mentioning the credits assigned to it. These credits – based on the European Credit Transfer System (ECTS) have been accepted for regular curricula (BA and MA) e.g. of University of Applied Sciences Potsdam or Cologne University of Applied Sciences.

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[17] See for details the nestor-story at http://www.langzeitarchivierung.de/modules.php?op=modload&name=PagEd&file=index&page_id=23

[18] See the links to the material at http://www.langzeitarchivierung.de/modules.php?op=modload&name=Downloads&file=index&req=viewdownload&cid=7

[19] Niedersächsische Staats- und Universitätsbibliothek / Heike Neuroth: nestor-Seminare. Einführung in die Langzeitarchivierung digitaler Objekte. Einführung in die Langzeitarchivierung und elektronische Archivierung im Archivbereich, DVD-ROM, Göttingen 2006

[20] German title: Die Rolle des Open Archival Information System (OAIS) beim Aufbau eines digitalen Archivs: Ein hilfreicher Leitfaden für deutsche Archive oder pure Theorie?

[21] See e.g. http://www.ifs.tuwien.ac.at/~becker/teaching/dp/summerschool07/ and http://www.dpc.delos.info/ss07/

[22] http://nestor.sub.uni-goettingen.de/education/index.php?lang=en

[23] See for details http://www.digitalpreservationeurope.eu/

[24] See for details http://www.delos.info/: The main objectives of DELOS are research and technology transfer through cooperation agreements with interested parties More about DELOS preservation activities at http://www.delos.info/index.php?option=com_content&task=view&id=25&Itemid=51

Here are some selected details of the topics of presentations and exercises during the Spring School 2007:[25]

- Introduction to digital long-term preservation
- Metadata: What´s it? Why needed? How to be applied?
- Format: An important metadata element. (Significant Properties, File Format Registries, Tools ...)
- OAIS as a model for digital curation
- Criteria for the selection of digital objects to be preserved
- Basic parameters for Preservation Policy
- Trusted repositories

The success and stimulating responses of the participants have motivated the organizers to continue with their efforts. The nestor Spring School 2007 was followed by two similar designed seminars: "The nestor Winter School" 2007 at the same location which focused on practical application aspect of digital curation[26] and – in 2008 – "The nestor Summer School"[27] which took place in Staufen/Breisgau. The next nestor School-event is scheduled for March 2009. All this school events take place in cooperation with and supported financially by DPE. On the other hand nestor cooperates with the schools organized by DPE (2007 Lithuania, 2008 Czech Republic, 2009 Spain).

5.3 The nestor Handbook

An ongoing nestor project activity is the publication of "The nestor Handbook" which is based on contributions of experts in the field of digital curation and was published as version 0.1 in March 2007. It is revised regularly (recent version 1.5). An additional printed version 2.0 is planned for summer 2009. The Handbook called "nestor Manual - A compact encyclopedia of long-term digital preservation (Eine kleine Enzyklopädie der digitalen Langzeitarchivierung") [Neuroth et. al 2007f.] is characterized on the nestor-website like this:

> "The nestor-manual <=Handbook; Ed..> tries to bundle the recent state of knowledge on digital long-term preservation and its various components. Collected and compiled in this "small encyclopaedia" the authors give the German speaking community access to the subject in a structured manual."

Some of the chapter titles are:

- State-of-the art of legal aspects
- National Preservation Policy
- Institutional Preservation Policy

- The OAIS (Open Archival Information System) reference model
- Trusted repositories
- Formats
- Relevant standards important in digital curation (e.g. PREMIS)
- Strategies of digital preservation

The digital version is provided free of charge under a Creative Commons License and available for download on a chapter basis or as a complete document (up to now more than 350 pages).

5.4 Development of a cooperative curriculum

Regarding the objectives of the nestor working group "Cooperation with Universities in qualification" it has never been the intention to set up an own digital curation curriculum. This would have been in contradiction to the funding Ministry which is a federal body. But nestor has the objective to stimulate the development and realization of such a program – whether it will be realized as further education or continuing professional education within a MA program.

Based on the understanding that none of the partner's active in the nestor working group will be able to set up a preservation-related curriculum by its own, it was decided to do this on a cooperative basis. This received support by experts and the administration of several universities in Germany and in other German speaking countries. Meanwhile a "Memorandum of understanding" has been signed by ten partner institutions to cooperate in developing and adjusting modules focusing on selected topics of preservation. They will be provided by the cooperating parties. Courses of other universities will be accepted in a local curriculum. The workload of each module will be calculated in credits in regard to the ECTS-system (European Credit Transfer System).

5.5 Development of e-learning modules and other plans within the nestor project

Meanwhile a main part of the partner's activities is the development of e-learning tutorials on digital preservation.

This is an opportunity to cooperate with other initiatives in European and other countries. And it is a chance to provide the content of the handbook and the presentations in English and connect them with didactically empowered content in e-learning modules.

During 2007/2008 e-learning modules are developed within student-based projects at the Universities of Applied Sciences at Chur (Switzerland), Cologne, Leipzig and Potsdam. Based on the e-learning platform moodle which is hosted by the Computer and Media Service (CMS) of Humboldt-Universität zu Berlin several courses in curation-related topics have been developed:

- The OAIS model
- Formats
- Compilation of a Submission Information Package (SIP)
- Significant Properties
- Digital Preservation of CAD-data

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[25] See for further details: http://nestor.sub.uni-goettingen.de/spring_school_2007/index.php?show=programm

[26] See for details http://nestor.sub.uni-goettingen.de/winter_school_2007/index.php

[27] See for details: http://nestor.sub.uni-goettingen.de/summer_school_2008/index.php?lang=en

- Digital Preservation of GIS-data

During winter term 2008 several additional courses will be developed and the existing ones will be enhanced. Quality management of the courses available and getting developed offers new chances to the Universities involved to intensify their cooperation and form strategic cooperation.

A survey regarding quality criteria of e-learning material showed clearly that there are no agreed standardized criteria to measure the quality of e-learning tutorials [Osswald/Otto/Stettler 2009]. The quality criteria chosen by nestor to be in focus are

- *technical* like stability, ability to run on different platforms, performance, and relation to standards

- *didactical:* stimulating self-paced and self-controlled learning and controlling the level of knowledge reached

- *usability* related (including understandability)

- *content* related regarding validity, integrity.

Based on a cooperative activity there will be several steps taken to improve these aspects of quality of the courses

- *before* the production process by enhancing the awareness of the didactical and structural concept of the courses and the tools and steps relevant to apply them;

- *during* the production process by applying collaborative assessment on the results available by checking them reciprocal in relation to the overall goals given;

- *after* the production process by evaluating the tutorials by different student groups of the Universities being active in the cooperation.

6. SYNERGY BY INTERACTION BETWEEN UNIVERSITY AND PROJECT BASED QUALIFICATION

There is some evidence that the activities of the nestor project and mainly the working group "Cooperation with universities in qualification" has stimulated reflections and awareness of digital curation even in those universities where the topic has been part of courses or programs since years. The results of nestor have influenced the content of lessons and courses provided. But nestor has also initiated cooperation where competition seemed to dominate: Instead of trying to hire a person out of the expert pool of nestor to offer specialized courses at single institution cooperation is planed.

The intra- and cross-sectoral cooperation offers new opportunities for participation in the results each party has available to all those who are willing to cooperate. nestor as an umbrella additionally offers the option to receive support by further national and international partners e.g. like DPE. nestor finally is a guarantee for a qualitative level of content related to those modules which will be certified by nestor – both in regard to research findings of the project in its different stages and didactically. nestor brings in the authority of a project in which leading German cultural heritage institutions are playing the major role. This is the network of competence and knowledge to which all partners are linked.

On the other side nestor as well receives insights and links to universities and qualification bodies which have never been reached in such a way before.

7. OPEN ISSUES

Nevertheless the first steps are undertaken and initiated by the nestor working group some other issues came up. The concept "developing e-learning tutorials by students for students" means that only in combination with an university lessons, modules could be developed. The consequences are that the development of e-learning tutorials is very slowly, because they must be integrated in the regular curriculum and there must be a interest from student side in developing such courses. On the other side the initial input given by the teachers by starting these courses every winter or summer time is high, because every new student group has to be introduced in the policy of developing such tutorials and into the guidelines.

The advantage is that the acceptance of using these tutorials is high. The students are not only getting skills in the field of digital curation but also in developing e-learning materials and learning in small project groups (soft skills).

Another open issue is related to quality management of these e-learning tutorials. Are the measures taken to ensure the quality of the tutorials is effective? Will it be helpful to establish an external "evaluation board" and what should be evaluated them?

All in all, the described activities are a very promising way to put the attention on the need of having qualification and education methods in place. Without putting enough funding money in this field we will not be able to preserve our cultural heritage not to speak from digital curation of research data, which seems to become more and more important (see e.g. ongoing international discussions on "open data").

It is not only a big challenge but also a big chance to work together on a university level, this is in the described form unique in Germany and German-speaking countries. It would be great if politicians and funding agencies could support this strong cooperation regardless of local or national structures.

8. REFERENCES

[1] Borghoff, Uwe M., Peter Rödig, Jan Scheffczyk: Long-Term Preservation of Digital Documents. Principles and Practices, Berlin 2006

[2] Memorandum on the long-term accessibility of digital information in Germany, Frankfurt 2006 http://www.langzeitarchivierung.de/downloads/memo2006-e.pdf

[3] Memorandum of Understanding. Kooperative Entwicklung curricularer Module zur digitalen Langzeitarchivierung im Rahmen des nestor II Arbeitspaketes 5. Göttingen 2007 http://nestor.sub.uni-goettingen.de/education/mou.pdf

[4] Neuroth, Heike; Liegmann, Hans; Oßwald, Achim; Scheffel, Regine; Jehn, Mathias, Strathmann, Stefan (Ed.): nestor Handbuch: Eine kleine Enzyklopädie der digitalen Langzeitarchivierung, Göttingen 2007 et seq. http://nestor.sub.uni-goettingen.de/handbuch/index.php

[5] Osswald, Achim; Otto, Dagmar; Stettler, Niklaus: Qualitätssicherungsstrategie für kooperativ erstellte eLearning-Kurse, (Paper to be presented at the 10th. International Symposium of Information Science, Constance, Germany, 1.-3. April 2009; in press)

[6] Osswald: Achim; Scheffel, Regine: Lernen und weitergeben - Aus- und Weiterbildungsangebote zur Langzeitarchivierung. In: nestor - Handbuch - Eine kleine Enzyklopädie der digitalen Langzeitarchivierung: Version 1.2, http://nestor.sub.uni-goettingen.de/handbuch/artikel/nestor_handbuch_artikel_141.pdf

[7] Niedersächsische Staats- und Universitätsbibliothek / Heike Neuroth: nestor-Seminare. Einführung in die Langzeitarchivierung digitaler Objekte. Einführung in die Langzeitarchivierung und elektronische Archivierung im Archivbereich, DVD-ROM, Göttingen 2006

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