Digital Editions of Music
Perspectives for Editors and Users
Proceedings

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Digital Editions of Music:
Perspectives for Editors and Users

The Department of Arts and Cultural Studies, Section of Musicology invites to a symposium on digital editions of music on Saturday 19th of January 2008

Digital media intensify the demands on musicology to appropriate new working processes. The symposium aims at elucidating the perspectives for digital music editions. Current projects will be presented, and the possibilities and challenges that both editors and users are facing will be discussed.

Digital media not only offer fast and flexible ways of distribution and presentation of music editions, they also call for new approaches to the process of editing music. Concepts made possible by technical advances have been discussed and explored for years, and efforts are now made to proceed from individual experiments to standardised methods for encoding and handling digital representations of music.

Archives of digitised sources and specialised software are developed to facilitate the editor’s work, at the same time giving the user powerful tools to explore, compare and make decisions. But also the very concept of editing is challenged by interactive presentations of sources, hypermedia archives and sheet music generated individually at the user’s request. The empowerment of the user calls for a debate on the future of scholarly edition: Are scholarly standards in music edition compatible with user-centred concepts offered by digital media?

The symposium aims both at presenting some of today’s cutting-edge projects in the field of digital music edition and at addressing some of the challenges that editors, users and the traditional concept of editing are facing. The symposium is financially supported by Sonning-fonden.

Proceedings are published for download at [http://digitaledition.musikvidenskab.ku.dk/](http://digitaledition.musikvidenskab.ku.dk/)
Programme

9.30    Registration & coffee

10.00   Welcome (Bjarke Moe, University of Copenhagen)
        Introduction (Axel Teich Geertinger, University of Copenhagen)

10.30   “CFEO and OCVE as digital editions: models, methods, and outcomes”
        Paul Vetch, Chopin First Editions Online/Online Chopin Variorum Edition,
        King's College London (GB)

11.30   Lunch

12.30   “Digital editions of Renaissance polyphony and lute tablatures: the model and the scholar”
        Dr. Frans Wiering, Department of Information and Computing Sciences, Utrecht University (NL)

13.30   “Publishing 15th century music: Open Access and Digital Editing”
        Dr. phil. Peter Woetmann Christoffersen, Department of Arts and Cultural Studies, University of Copenhagen (DK)

14.30   Coffee

14.45   “The Edirom tools as an approach to digital editions of music from the Common Western Notation period”
        Johannes Kepper, Edirom, University of Paderborn (DE)

15.45   Final remarks
# Participants

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From left to right: Peter Woetmann Christoffersen, Paul Vetch, Axel Teich Geertinger, Frans Wiering, Bjarke Moe and Johannes Kepper (Photo: Hans Mathiasen)
In his doctoral dissertation on the style of Palestrina and the dissonance, Knud Jeppesen provided in 1922 detailed statistical account of various kinds of dissonances in Palestrina's works. Jeppesen's groundbreaking work was to become one of the most influential contributions to the study of Palestrina in particular and Renaissance music in general. The counting of dissonances may at first sight not seem particularly relevant in a discussion on digital editions of music. But it may very well be. As we shall see today, editing music in digital environments is much more than a question of fast and easy distribution of musical works otherwise published as precious printed volumes, mainly accessible in the reading rooms of specialised libraries.

Basic methods for the preparation, storage and dissemination of texts in digital media have been in use for many years now. Also, theoretical frameworks for scholarly working with digital representations of texts and objects have been developed. Nevertheless, an attitude towards new media in music editing and publishing still frequent among musicologists, editors and publishers is reluctance or even rejection. This may to some extent be simply due to a feeling of uncertainty about what digital media can and cannot do, or due to a scepticism rooted in a generalisation of the incredibility or low status still associated with online publications. This is one of the issues to be discussed later today by Frans Wiering. Some scepticism is of course appropriate, also in the assessment of digital editions, but our scepticism should as always be a constructive one, aiming not at rejecting the media in general, but at optimising its benefits.

There is no doubt that digital media already have influenced, and in the future will in some ways fundamentally change our conception of modern editions and editorial practices. I believe that the projects to be demonstrated here today have the potential to silence discussions on whether digital media are relevant to music edition at all, and instead turn our focus to questions as e.g. how to use digital media and under which premises. Today we may ask ourselves: What do we want from digital editions? What should they be – and what not? There seems to be a growing interest in the field of music edition in Scandinavia in general, and perhaps in Copenhagen in particular. The perspectives of scholarly digital music edition, however, have not attracted much attention yet. Therefore please allow me to start today’s programme with a few remarks on just some basic concepts and approaches.

First, we may need to ask what a digital edition is. A traditionally conceived paper edition, converted to the PDF file format and published on the Internet certainly is a digital edition, though only in a very limited sense. I admit that this simple kind of digital edition is – at least for the time being – also the final product of a workshop on music editing, which Bjarke Moe and I conducted this fall. The work-
shop produced a critical edition of the quite unknown composer Gabriel Mölich’s “Geistliche Madrigal” (sacred madrigals) from 1619. Mölich was not primarily a composer, but actually a dancer; he was the elector of Saxony’s ballet master at Dresden, but studied composition with Heinrich Schütz, the elector’s maestro di capella. He was even granted a journey to Italy to improve his skills and to study the new style of composition on location in Florence and presumably also Venice. During his stay in Italy he wrote the “Geistliche Madrigal”, published as partbooks on his returning to Germany. One of the three surviving complete copies of the partbooks is kept at the Royal Library in Copenhagen.

These twenty sacred madrigals are the only works by Mölich known, making our edition actually a “Gesamtausgabe” – a complete edition – though probably one of the world’s smallest. Whether Mölich did right in pursuing a career in dancing rather than composing you may judge for yourself. A preview of the edition will be on display during lunch break on a laptop computer, and students from our workshop will be there to answer any questions. When finished, the edition will be made available as part of the Royal Library’s collection of digital music along with the facsimile of the partbooks already online. At this point I would like to thank the Royal Library for their cooperation on this project.

2 Ca. 1600 - >1655
3 The other known copies are located in D-Dl and S-Skma
As I said, our edition is a very simple one in respect to the perspectives of digital media. At best, a PDF edition may overcome some limitations of printed editions as to the production costs and distribution. But valuable information has been lost – or at least made inaccessible – during the process of creating the files. The music notation software used for editing internally stores the music in an encoded format as structured data in order to let the music be computable and editable. PDF however is a file format describing the graphical appearance of text and images, producing a visual output intended to be read and decoded by the human eye and mind. Structured musical data have no place in it. By choosing the PDF format we have actually precluded ourselves and the users effectively from further processing the data, thus loosing some of the most powerful advantages of digital media. However, as our workshop was basically an introduction to music editing in general, producing an advanced digital edition was not possible within its scope. We plan to publish at least a rudimentary MusicXML version of the edition as well, though.

For those not familiar with strategies for encoding musical structures, I will attempt outlining very briefly some basics. Various encoding standards have emerged, some also discarded, but here I will limit myself to mentioning XML (short for eXtensible Markup Language), which is a universally adaptable coding concept in plain, readable text. XML and music-specific sub-standards such as MusicXML provide a very different approach to digital editions than the one inherent to e.g. PDF publications. XML basically adds textual markup to a text, superimposing on it information about its structure and internal relations or adding annotations to specific parts of the text.
Let us take a look at a book, for example. In order to digitise the book, we may simply make a digital photographic copy of its pages. Alternatively, the mere literal text may be extracted from it and stored as a text file, making the text searchable or editable in the computer. Taking the text approach one step further, we can enrich this linear string of letters and symbols with markup – the so-called “tags” – containing information on e.g. the hierarchic structure of the text. This is the basic principle of XML (the book example is of course simplified, just to illustrate the point – all kinds of bibliographic data could be added). From this textual or structural representation, we can easily produce graphical representations like PDF, whereas the reverse process is at best problematic. By observing certain coding standards, encoded representations of sources become immediately comparable, thus providing a basis for further processing. The same coding principles as shown in the book example can be applied to music to create digitised versions of a music text. There is a number of ways of doing that, MusicXML being just one of the options.

In the case of the structurally marked-up text being a transcription of one particular source, the main physical features e.g. of a codex holding the text can be encoded along with the literal text to form an integral part of that specific, digitised instance of the text. The digitally encoded representation then becomes a simulation of the text as an object, reminding us that the “text” of any work, whether of music or literature, not only consists of a sequence of letters and symbols. It is transmitted to us as dis-
distinct instances of the text, all having a specific physical appearance – a fact that may be unintentionally obscured by the standardised layout of modern printed editions.

Though digital technology may encourage and facilitate the trend towards purely image-based editions, interesting perspectives are opened by the combination of image-based and text-based representations of the same sources: The XML markup may relate each part of the text to its location on digital images of the source, thus tying together the graphical and structural domains. In this way, facsimile editions may be turned into critical editions by overlaying editorial and contextual information onto photographic reproductions. In the future, the traditional distinction between facsimile and critical edition thus may blur or even disappear as features from both sides are combined: The greatest possible amount of information on the physical appearance of the source on the one hand and the highest standards of scholarly editing on the other. Some easy switching between or parallel views of the facsimile and a transcription or edition is another option, overcoming the usual trade-off made in printed facsimile editions, where the legibility of modern printed editions is traded for a detailed reproduction of the source.

One model for scholarly editing within such a digital environment has been provided by Dr. Wiering a few years ago with his multidimensional model for a hypermedia archive storing various kinds of data on a particular work such as facsimiles, their digitally encoded representations, audio recordings, the
editor’s annotations, contextual information, internal links between sources and external links to related works. An edition in printable, modernised notation is just one of many possible outputs to be generated by a certain combination of the data stored in a digital archive. The flexible and dynamic nature of such a digital edition obviously is a great strength. Just imagine the following terrible scenario: Shortly after publishing in print a scholarly edition of a symphony, an important source — say, an autograph fair copy believed to be lost — suddenly turns up. In a digital edition based on an archive of encodings of the sources, this would pose no serious problem. An encoding of the newly discovered source could be added to the archive along with the editor’s annotations and decisions as to the changes to be made in the edition, resulting in a new, updated edition immediately available.

Digital editions are by nature transient, whether generated on the fly at the user’s request or finalised by the editor and stored as e.g. PDF files. Printed editions or any other representations of a work of course also have a limited life-span, but in digital media the life expectancy of an edition appears to be considerably shorter, or at least uncertain due to ever changing technologies and the inescapable need of electronic devices to translate digital data into representations comprehensible by humans. The preservation of digital media is indeed a serious issue. On the other hand the apparent volatility emphasises that digital editions are renewable. They allow for changes and improvements. Editorial practice may be changed over time, yielding updated editions without having to start all over each time. Even a small change in an edition’s guidelines may in principle be reflected instantly in an online edition, keeping the works published updated in accordance with the guidelines and ensuring a homogeneous editorial practice across all the works presented at all times, something that could be difficult in long-term edition projects like the Neue Mozart-Ausgabe, spanning more than half a century.

If the digital editions are stored as distinct versions with each revision, the digital archive will itself become a historically important object, documenting a certain part of the work’s transmission (and of course it would in principle be sufficient to freeze and save the state of the entire archive at a given moment in order to preserve the edition produced by it; so, the archive shown on the right would perhaps really just consist of backups of the archive on the left, including the editorial principles and whatever else may be in it).

Being open to changes, digital editions may also encourage a more open-minded, cooperative attitude towards editing music than has been prevalent; an attitude that may very well improve the final edition. By making available online preliminary editions and inviting comments from the public during the process of editing, one may potentially have the entire community of scholars reviewing and proof-reading it — for free. An argument for such a change of attitude will be made later today by Peter Woetmann Christoffersen.

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Perspectives for the use of digital archives go far beyond producing editions. The potential range of applications and analytical tasks is overwhelming, provided the data are freely accessible to scholars. This brings me back to Jeppesen: By comparing the 15 settings of the Crucifixus with the settings of the Benedictus in Palestrina’s masses, Jeppesen found that the former comprised 2,484.5 dissonances as opposed to the 2,869 dissonances in the latter. It goes without saying that it is not my point discussing Palestrina’s style here, but one cannot help being impressed by the very numbers – or rather: by the effort needed to establish them. Had Palestrina’s works been available digitally encoded to Jeppesen (which of course they could not have been in the 1920s), the counting of dissonances could probably have been done very quickly with a little programming. It may be argued, of course, that the encoding of the sources would require an even greater amount of time than counting dissonances manually, or that to Jeppesen, more valuable than the resulting figure may have been the process. However, the point here is that once the coding is done, the data could be used to perform countless analytical tasks with a minimum of additional effort – or to generate editions, whether printed or digital, now and in the future. So, archives of digitised sources of music could be just as valuable to the public – or to scholars at least – as the edition produced from them. Under no circumstances should they be regarded as just an internal working database for a board of editors.

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As digital editions can be generated at runtime – that is, at the user’s request – the user may be given authority over certain aspects of the edition. By giving the user the opportunity to choose from a range of notational standards, levels of modernisation or different page layouts, the edition may be customised to meet the user’s requirements without affecting the edition’s scholarly quality. In a model even less restricted, the user may in principle also be allowed to choose the “reading path” through the material, thus deciding not only on certain preferences of presentation, but also on the sources to be used and by which criteria. The user may ultimately create his or her own edition without any restrictions.

But the user’s freedom – the empowerment of the user, which of course also may have ideological undertones – seems to have its price: With unlimited control given to the user, the scholarly standard of the edition generated can no longer be guaranteed.

At the Nordic Music Editions Symposium held at the Royal Library here in Copenhagen in 2005 one of the main themes was “the authority of the composer, the authority of the editor”. Paraphrasing that headline, one potential focus point here today could be “the authority of the editor, the authority of the user”. What are the perspectives of the user’s empowerment? Is the editor’s role as the one making the choices being transformed into the role of the guide or teacher with the task of educating the users, thus ideally enabling them to make equally competent choices for themselves?
User-centered editions

The questions raised by digital editions are numerous, of which I have already mentioned some. How do we deal with the apparent low status of digital editions as compared with printed ones? And how may digital media assist scholarly editing by means of new editorial procedures? These are some of the issues to be addressed here today.

For that purpose we have invited speakers from what appears to us as some of the most inspiring projects within this field. I am sure that the projects and papers to be presented will be quite eye-opening to many of us both as to where digital editing tools stand today and as to the more problematic issues to be solved in the future. I want to thank the speakers for accepting our invitation, and I am also very pleased to see that our symposium has attracted so many participants – not only from Denmark, but also from as far as Stockholm and Tallinn. Welcome to you all.
CFEO and OCVE as digital editions: models, methods, and outcomes

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Abstract

The Centre for Computing in the Humanities has, for the past 3 years, been in the rather unique situation of participating in two quite different projects situated at the cutting edge of Chopin scholarship. The Chopin's First Editions Online (CFEO) project was funded by the UK Arts and Humanities Research Council and its stated goal is implicit in its name: democratised (online) access to a large and highly significant collection of digitised score images brought together and compiled within a virtual collection, by two of the foremost scholars in the field. The CFEO web resource is of course much more than a simple repository however; it is itself a complete edition, combining the image archive with scholarly apparatus and prepared with all of the academic rigour one would expect from the highest quality traditional print volume. At its core lies a conceptual system for storing and visualising the available editions and sources which was amongst the most intellectually challenging components of any project CCH has developed. CFEO was completed and launched in September 2007.

The Online Chopin Variorum Edition (OCVE) project, underpinned by the same scholarly team but funded by the Andrew W. Mellon Foundation, was originally developed as a pilot project. Unlike the fairly traditional approach taken in the CFEO project, OCVE set out from the beginning to push the boundaries of what was technically possible in order to try and build an application which would provide tools for new modes of scholarly enquiry rather than a simple digital repository. The original prototype, completed in 2004, allowed web based annotations which could be freely arranged into a taxonomic (or any other) hierarchy by users, and provided web based drag-and-drop comparison of individual bars across multiple editions, both by juxtaposition (by dragging bars and arranging them spatially onscreen in ways helpful to their study) and, experimentally, by superimposition – allowing users to layer bar images on top of one another to allow minute differences between imprints to be more easily detected. In 2004 this was relatively sophisticated behaviour for a web application (although it is far from unusual now!). As is usual in an experimental project, not everything about the OCVE pilot was a success and in the best tradition of technical development the results are now informing development of the full web application, to be launched in 1Q 2009.

At first glance, the OCVE and CFEO projects represent two very different conceptual faces of the digital edition. CFEO applies a more conventional methodology: it is a primary resource, designed around affordances for interrogation and browsing familiar both from existing print and digital publications; whereas the OCVE pilot takes almost an opposite approach, abandoning the more obvious affordances of traditional editions in favour of supporting and modelling the process of research. This paper will explain how we approached both projects, and introduce the new OCVE prototype into which we are attempting to distil something of the best of both worlds.
Annotated presentation

**CFEO and OCVE as digital editions: models, methods, and outcomes**

Paul Vetch
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Digital library = static digital repositories, variable quality
Democratised access to large repositories of data. Transition from CD-Rom to WWW has in theory increased democratisation.

**Origins of digital resources**

- **Digital Library**: large scale digitisation projects, CD-Rom based
- **Web transition introduced the (now largely accepted) concept of democratised access to large bodies of data**

**Popular academic perception of digital resources**

- **They are quick to create and technology is more than capable of supporting them**
- **They are ‘unreliable’: less academically sound than ‘traditional’ academic resources / reference works**

Problems associated with technology

- Perception of speed and 'automatic' processing: rarely true, especially not with music, which presents some of the greatest technical challenges because of its complexity and because it involves working with text, images and audio data.
- Poor academic credentials: digital work not highly regarded. Take RAE for example. A high quality digital resource requires first rate academic input but often is not credited as such – which is a major problem.
Known to most people as an 'electronic surrogate' or a simulation of something which exists in physical form. Best examples are the online editions of newspapers which advertise themselves as 'exact digital replicas' of the real thing and which even attempt to 'feel' like the print equivalent. I raise this specifically here because as you will see the projects I'm going to discuss are good examples of situations where the potential of traditional or 'original' format is exhausted.

Probably the most significant impact of technology on traditional academic practice has been (and should continue to be) its tendency to force us to critically reevaluate that practice. The process of creating / designing scholarly digital editions requires a balance to be struck along the dual axes of what’s possible and what’s desirable / useful / needed.

Content: Primary source: a digital edition enables unlimited images of course, maybe also transcriptions? Audio? Other stuff. But, there are also major issues of reproduction rights to consider which become much more sticky when online publication is involved. Also what about secondary material: what sort of critical apparatus is appropriate?

Level, nature, status, and origin of intervention
Form: how delivered? Online? CD? A mixture? Print and digital?

The question of ‘affordance’ - what it is that we will allow the user to ‘do’? This is a question which is simply not applicable to a traditional print enterprise.

Increasingly digital resources seek to share intellectual responsibility for the ‘end result’. Legacy of ‘Web 2.0’ – the idea of ‘product vs. process’; a resource which ‘becomes animate when people use it’.

The danger of digital editions is that both axes
The scholarly digital edition in 2008?

- Interactive, fluid perspective
- An environment
- Exhaustively comprehensive within a finite scope
- Inherently 'New bibliography' aware: more mouvance, less authorial intention

if you like are very much ‘of their time’ – the availability of something new can create a need that never existed before and this is happening all the time at the moment because of the pace of technical development.

Defining characteristics of a digital academic resource tend to include:

Interactivity and controllable perspective: user can choose to show or hide different texts or views of texts, effectively giving them a degree of editorial responsibility.

Environments supportive of research: there is a tendency to want to introduce additional 'tools' to allow users to do more of their work 'online' or within the context of using the resource itself. Classic examples include annotation and lightbox functionality.

Exhaustively comprehensive: tendency to want to preserve and represent not only a large or complete set of primary sources but also a comprehensive set of secondary evidence. Often the desire would be to try and present all of the evidence used by the editor to prepare the texts and apparatus.

Awareness of the modernist debate in textual criticism / bibliographic studies which recognises the primary importance of a 'shifting sands' model - a fluid edition which records but tries not to judge textual variance / mouvance - rather than an edition that attempts to restore or construct a hypothetical authorial 'ur' text.
It is not true to say that there are no limitations on digital media. There are many, especially where music is concerned. One of the biggest limitations is the imagination of the editor...

We need to think very critically about the extent to which digital editorial practice can or should be different to traditional editorial practice. Although it is easy to see the printed page as a limiting factor in what it is possible to do with a traditional edition by the same token it can be sometimes be worth thinking of the printed page as a set of parameters which very clearly define an editorial project. The lack of parameters / terms of reference defining what a digital edition can often be more problematic than liberating. The familiar form and practice of traditional print editing is difficult to escape from usefully.

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**Case Studies: Chopin Online**

Chopin’s First Editions Online (CFEO) and the Online Chopin Variorum Edition (OCVE)

Royal Holloway, University of London
John Rink (Project Director), Julia Craig-McFeely (Project Manager), Christophe Grabowski (Research Fellow)

Centre for Computing in the Humanities, King’s College London
John Bradley, Paul Vetch

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**Research Questions**

1) How is the “work concept” challenged by the Chopin sources?

2) What is the best means of capturing in an edition the creative history implicit in the Chopin sources?

3) How might technology enhance and inform the musician’s and the musicologist’s understanding of individual sources, their interrelationships, and their significance as artistic and cultural artefacts within a rich history of publication, pedagogy, and performance?
Chopin’s Publication process gave rise to three first editions, each of which is unique. His writing is characterised by continual evolution, not always initiated by him.

This means that for any one piece there can be an enormous number of sources. To allow you to better understand the scale of the problem here’s a list of all of the known primary sources for Prelude Op. 28 No. 4.

And here is a list of some of the editions to which a musicologist would need to turn in order to begin a thorough analysis.
This grid represents the four most recent new Chopin editions. There are two print editions and two new online editions, and there is a relationship between them which should become clear.

To give you a sense of the scale of the research question here, see if you can spot the difference above. These are the first and a subsequent second impression of the French first edition of the Preludes Op. 28 (an impression being an issue of an edition). This differences are small but there are many of them and they would often make a difference to the performance of the piece.

The first and second impressions of a first edition have historically been incorrectly considered under the blanket term ‘first edition’. You can see from the nature of the difference even in the small example above that this is not accurate.
This is an example entry from the print annotated catalogue which is the work of John Rink and Christophe Grabowski. It gives a sense again of the vast number of different impressions which are floating around.

You can see that this is an extremely comprehensive tool, albeit one of some complexity and it is by no means an ‘end to end’ solution for a musicologist. This is a reference edition which tells you where you need to look next.

It was John Rink’s frustration with this sort of approach which led to the application for funding for CFEO.

You can quickly see that one of the first problems for the musicologist is the sheer quantity and distribution of all primary and secondary sources. This was the problem that led to the creation of the Chopin’s First Editions Online web resource which attempts to gather together in one place as many first impressions as possible in a way which negates the need for a lot of the secondary ‘catalogue’ type material but retains the scholarly analysis / critical apparatus and comparison between editions.

The website http://www.cfeo.org.uk provides facsimile and critical apparatus and analysis in a way not practical or possible in print.
Historical background

Introduction

Chopin's first editions pose major challenges to musicians and musicologists alike because of their considerable rarity and complexity. This is particularly true if one takes into account the comprehensive appreciation and evaluation required to understand the creative history, understanding just how Chopin's oeuvre came to be preserved. In this sense, the present paper, which is part of a larger publication project, aims at providing a comprehensive overview of the history of Chopin's music, including significant achievements and critical issues. This paper focuses on the historical background of Chopin's music, with a particular emphasis on the first editions. It provides an in-depth analysis of the diverse approaches used in the publication of Chopin's works, highlighting the evolution of the musical notation and the impact on the performance practice. The paper also addresses the challenges faced by musicologists and librarians in preserving and making available these rare and valuable resources.
The Peters Edition “Complete Chopin” edition represents a serious attempt to overcome some of the problems inherent in the actual analytical process of understanding how these multiple Chopin editions are different from one another. These are the basic principals.

This visual representation of variants is extremely effective...
... but there are practical limitations inherent to the printed format which quickly results in complex pages.

This is the problem which OCVE attempts to tackle in a slightly different way.

**Questions**

1) How is the “work concept” challenged by the Chopin sources?
2) What is the best means of capturing in an edition the creative history implicit in the Chopin sources?
3) How might technology enhance and inform the musician’s and the musicologist’s understanding of individual sources, their interrelationships, and their significance as artistic and cultural artefacts within a rich history of publication, pedagogy, and performance?

An interesting starting point for the underlying approach taken in the OCVE project is summarised in this passage from Gunther Kress.

Talking about the use of new media and in particular the screen to represent texts:

I myself specialise in interaction design and so for me this is an very interesting concept – the idea that creating an edition is in effect proximate to creating an interface, the same sort of activity:

- Interfaces/Editors mediate what people will (and won’t see), and how it appears
- Interface/Editorial decisions can represent academic collateral

“The designer [editor] of such ‘pages/sites is no longer the ‘author’ of an authoritative text, but is a provider of material arranged in relation to the assumed characteristics of the imagined audience. The power of the designer [editor] is to assemble materials which can become ‘information’ for the visitor, in arrangements which might correspond to the interests of the visitor.”


Online Chopin Variorum Edition (OCVE)

- Pilot project: May 2003 to October 2004
- Phase 2: November 2005 to October 2008
- Successive phases?

‘Dynamic Musical Edition’ – dynamic in terms of the source material, the tools, and the online environment in which they could be interrogated.
Our original goals were these. Collation / interpolation was not possible because of lack of representational language.

Technical Methodology / Objectives

- Superimposition
- Juxtaposition
- Collation/interpolation

Outcomes

- Pilot website: http://www.ocve.org.uk

[SITE DEMO]

What happened:
Juxtaposition: was found to be helpful
Superimposition: Because of technical limitations, superimposition could only really be helpful where one already knows where a difference occurs. Good example of why it is a good idea not to fall in love with technical solutions!
Annotation: wasn’t used as a personal layer but ended up being used by the project team to reintroduce the apparatus criticus! The idea that critical apparatus could have the status as detachable annotation is very interesting, potentially a nice way of handling the issue of ‘losing’ control to the user-editor.
Collation and interpolation were not achievable because there was no suitable representational markup format at the time. Now MEI is beginning to look like a possibility though.
In the second phase new material is being added.

Phase 2: content expansion

- Repertoire (2,280 new images)
  - Four Ballades
  - Four Scherzos
  - Fantasy Op. 49 and Polonaise-Fantasy Op. 61
  - Twenty-Four Preludes Op. 28 and Prelude Op. 45
- Secondary sources introduced for previous case-study pieces (120 new images)

And we have a more well rounded list of goals we’re trying to achieve based in large part upon the feedback we received to the very limited pilot work.

Phase 2: deliverables

- Interlinked archive of digitized sources
- Various display formats
- Phiological description
- Personal annotation tools
- Pick-lists of scores or works
- Interactive Critical Commentary

Page View, Zoom Mode

- CFEO tree view enhanced for quicker navigation and additional functionality
- Thumbnail preview of available witnesses
- User-configurable witness selection or “filtering”
- Full-size images delivered via Zoomify (for now)

Witness filtering will probably also be globally configurable, so that if you knew you were not going to be interested in any of the Preludes for example you could suppress their display
Page View, Bar Selection Mode
- Thumbnail images update to show current context
- Dynamic representation of bar mapping
There will also be a line selection mode along similar lines although that hasn’t been built yet.

Critical Commentary, Interactive Mode
- Displays amalgamated Critical Commentary at the work level
- In interactive mode, user-submitted content available for viewing
- When logged in, user can submit comments on the commentary
- Nominated users will be able to edit the Critical Commentary
- Elements of Wiki and Blog interaction

Bar View
- Drag-able individual representations of bar images (as in OCVE1)
- Interactive interface responds immediately to user input / customizations
- Configurable screen display allows quick access to tools and commentary
As you drag the images around the witness icons reorder, and similarly if you drag the icons around the thumbnail representations will rearrange themselves.
Bar View, Adding an Annotation

OCVE1 also offered the ability to organise / group annotations in a tree and we may consider that here, but presented as a tagging / categorising mechanism like a blog tag cloud taxonomy.

- One-click / “just-in-time” annotation
- Name of annotation easily altered
- Annotations can be linked to one another or to flags / flag categories
- OCVE1 public / private distinction will be maintained

Bar View, Flags

- Easy and quick mechanism for adding “post-it”-style flags to images
- Allows arbitrary groupings to be established
1. Sustainability; keeping pace with technology is a never ending story. We need to be responsive to the way in which general perception, usage, and expectations of electronic resources, particularly online ones, is changing.

2. Chopin wrote orchestral pieces too. Display of orchestral scores present major problems for this system.

3. We must think seriously about the status of user’s responses; idea of ‘product vs. process’; a resource which ‘becomes animate when people use it’.

4. This layer of expertise / interpretation is valuable and this articulates a key distinction between Web 2.0 and next generation digital resources for scholars.
Digital editions of Renaissance polyphony and lute tablatures: The model and the scholar

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Abstract

To publish a scholarly edition of a substantial amount of music is an acknowledged means for a musicologist to attain professional status. By showing that one is in command of an important professional skill, one becomes participant in a tradition that is now almost two centuries old. Moreover, the result of one’s labour is a tangible object that will be safely stored in dedicated libraries, thus ensuring the long-term preservation of one’s work and reputation.

Why, then, would one want to leave these certainties behind and turn to the digital media, the Internet in particular, for publishing one’s editions? Some practical reasons are speed of publication and ease of access. But are these strong enough to balance the Internet’s reputation as a sanctuary for volatile information, the quality of which is often difficult to assess? And is it worth the effort to acquire technological knowledge that may be outdated tomorrow, or to store precious data in formats that cannot be guaranteed to be understandable in the long-term future?

One must have very strong reasons to enter this uncertain territory. In my opinion the most fundamental of these is that our present understanding of what a composition is does not agree well with the book format in which editions are published (McGann 1995). Rather than considering a composition as an immutable, independent object (a ‘musical work’) that can be represented by a single score, we like to emphasise a composition’s flexible and relational aspects as they emerge from its creation, performance, adaptation and reception history. Access to and coordination of the different ‘instances’ of a composition (notably music notation sources and sound recordings) then become crucially important.

It seems natural to seek for solutions in computing and the digital media to represent and organise such complex information. Two projects I have participated in did so, the Corpus Mensurabilis Musice Electronicum (http://www.cmme.org), led by Theodor Dumitrescu, and the Electronic Corpus Of Lute Music (http://www.ecolm.org), led by Tim Crawford. A large part of my presentation will be a discussion of the (partial) answers that were created in these projects to questions of storage, enrichment, coordination and presentation of source information and editorial interpretation.

It will emerge that being liberated from the limitations of the book format does not mean that we enter the realm of unlimited possibilities. Computing involves the creation of formal models of information and processes. This is difficult work, even when it is possible to give a complete specification of the problem. We are still a long way from being able to do so for scholarly digital editions of music. Indeed, there are good reasons to assume that many key concepts in humanities research cannot be specified in this manner (McCarty 2005).
Therefore, computational models in the humanities, including models for music editions, have a transient nature. Yet, even though the perfect model may seem to be perpetually unattainable, practical solutions for digital editions that serve musicology better than the book model are appearing already now. For such solutions to mature two things are important: that a community of researchers of sufficient size is willing to commit itself to using, evaluating and creating digital editions; and second that, as a scholarly mode of publication, digital editions are granted an equal status to paper publication.

References
http://www.iath.virginia.edu/public/jjm2f/rationale.html
This slide provides an explanation to my title. The creation of sophisticated applications for digitally editing music requires two disciplines to be connected that have little in common: Computer Science and Musicology. To connect these, I take an intermediate role, that of a computational musicologist. This role tries to connect musicological research questions with Computer Science. Modelling is an important aspect of this role.

For more information about the two projects I have been involved with:
http://www.cmme.org/
http://www.ecolm.org/
Entering the realm of digital critical editions of music means leaving the certainties of a well-established research paradigm behind, and being confronted to a number of barriers. The good news is that some have entered this area before; the resources they created can help to form an idea of what an advanced digital edition might look like and what advantages it would offer.
The digital facsimile of the Copenhagen chansonnier is at
http://www.kb.dk/permalink/2006/manus/702/eng

DIAMM: http://www.diamm.ac.uk/
OCVE: http://www.ocve.org.uk/

The Werner Icking Archive is another important resource of this type:
http://icking-music-archive.org/
From the perspective of digital critical editions, such resources are particularly important as an example of how a community can work together in creating large-scale resources. The model is still the book: a finished product, consisting of pages with static content. The musical information cannot be further processed.
The Caron edition is at
http://www.une.edu.au/music/Caron/
This composition is available as
score:
http://www.une.edu.au/music/Caron/scores/
Accueilly_m%27a_la_belle.pdf
mp3:
http://www.une.edu.au/music/Caron/sfiles/
Accueilly_m%27a_la_belle.mp3

An important extension beyond the book
model is the addition of sound to the edition.

The main benefit of encodings is to enable
automatic access to the musical information
content. An encoding system presents a formal
model and therefore a reduced view of the
score. The information loss may vary from de-
tails of layout to disappearance of basic prop-er-
ties such as text, pitch spelling, barlines and ab-
solute durations.
Encodings: **kern example**

![Image of Kern Scores]

Encodings

- advantages
  - not just rendition of the visible surface
  - in principle: access to ‘information content’
    - information can be manipulated

- drawbacks
  - bewildering variety of formats
    - D Around, Paine and Easle, MusicXML, MEL, TabCode, CMIME, MCL
  - often designed with specific goals (shortcomings?)
  - special software needed for display and manipulation
  - usability of raw encodings is low
  - support may be problematic, especially for academic systems

Summary of exploration

- selective overview
  - several more advanced projects aren’t represented

- general impression
  - often it is just the infrastructure that is different
    - page orientation, fixed content
  - some exploration of new possibilities
    - editions that contain sound
    - manipulation of encoding
    - collaboration

- so what we find is mostly substitution, but little redesign
  - systematic exploration of new possibilities needed
  - challenge: develop models for editing that suit 21st century musicology
  - briefly look into library editing
The Rationale of Hypertext:
http://www.iath.virginia.edu/public/jim2f/rationale.html
The diagrams in this and the next slide are my own interpretations of McGann’s ideas.


These ideas are some of the possibilities that come to mind in applying McGann’s concept of HyperEditing to music.

Case study 1: ECOLM

- Electronic Corpus of Lute Music
- Principal goal: to store and make accessible to scholars, players and others, full-text transcriptions of sources of music for the Western-European lute
  - Historically and musically a very important repertoire
  - From the 15th to the 18th century, ‘one of the most widely used domestic solo instruments’ (Grove)
  - 60,000 surviving pieces
  - Lute repertoire quite inaccessible because they employ a specialised type of notation, tablature
  - A digital edition could make tablatures, sound (and at a later stage, transcriptions) easily accessible to scholars

ECOLM is at http://www.ecolm.org/
The URL for the example is http://doc.gold.ac.uk/isms/ecolm/database/?type=41&ID=155&TextID=609. A MIDI version that is automatically generated from the encoding can be played from this page.

A complete description is on the website: http://doc.gold.ac.uk/isms/ecolm/?page=TabCode

ECOLM: some observations

- Representation of source information
- Access improved by MIDI playback
- Availability of encoding allows other forms of processing (analysis, searching)
- Considerable technological risk
  - expressivity of TabCode is limited
  - depends on academic software created for this project

An example of proposed TabXML markup.
This example shows a Bourée by Sylvius Leo-
pold Weiss that survives in 7 sources. Variants
from four of these were encoded in one
TabXML document, from which different se-
lections were drawn using a number of XSLT
sheets. This slide shows a traditional visualisa-
tion of variants.
Most variants are rhythmic; they may be differ-
ent attempts to indicate an inégale performance
in notation.

Another view, generated from the same source
document. The Paris source is shown as the
complete composition. Variants from the other
sources are shown in parallel.

Another view, showing the number of different
variants that exist for a given tablature event.
The darker the background colour, the more
variants.
Editing Hayne van Ghizeghem’s De tous biens plaine (after Copenhagen Chansonnier) using CMME software. Modern texting is being added using the text window on the right.

The score on the left displays the Copenhagen version of Hayne’s chanson; that on the right the Dijon version. In the variant window variants can be compared.
Example views that can be chosen in the viewer. On the left: original clefs, accidentals and texting, with ‘tick’ barline style; on the right modern clefs and texting, editorial accidentals and ‘Mensurstrich’ barline style.

### CMME: some observations

- **conceptual separation**
  - source information
  - editorial interpretation layer
  - display layer
- **variants**
  - experimental implementation
  - default version = editorial reading
  - errors are in variants
- **editing as an ongoing activity**
  - add new information as it becomes available
  - editing can become a collective project
A digital critical edition of music may ideally consist of the following, interconnected components:

- digitised sources, from any relevant medium: usually these will be score facsimiles, but video and audio recordings are explicit options;
- source encodings, making the information content of the sources suitable for computer processing;
- annotations; categories include textcritical features, inferences (e.g. related to performance), musicological knowledge;
- links to related works.

Warning: this is an abstract, conceptual model, not a plan for a concrete implementation.

Such a collection of information can be imagined as a multidimensional space, in which different categories of information each occupy a different axis. For example, in addition to the two dimensions of the score, one can imagine versions, emendations, transcription styles and adaptations to performance as additional dimensions to the edition. These are not so much meant as dimensions in a mathematical sense, as to suggest ways of accessing the edition, for example by projecting information onto a plane or by taking two-dimensional slices from it. Examples of such views are a diplomatic or emended transcription of a source, an apparatus, a stemma, or an edition conceived as a reading path through sources and annotations. At least as important is the possibility of switching views, for example from an apparatus view of a particular passage to the context in which it appears in a source, or – when multiple works are edited in this way – from a collection of similar features to the works in which they appear. Users can contribute to the edition by adding their own views and annotations.

Digital critical editions: the drawbacks

- user
  - orientation in a multidimensional space
  - possibility of generating meaningless views
- authorship
  - who gets the credits
- hard to model
  - procedures (even transposition isn’t simple, expertise
  - relationships, hierarchies
  - uncertainty
  - nuances
  - plurality
- existing (from a Computational Musicology viewpoint)
  - because scholarship itself is being analysed

The next step(s)

- existing models: still primitive
  - further requirements gathering needed
  - will lead to stabilisation
- active engagement of musicologists
  - niche applications seem quite well developed
    - technical risks still issue
  - involvement will improve status
- experiments with challenging materials
  - music where multiple instances of work matter
    - popular music (cover songs)
    - works with problematic source situation (Bach, Mass in B minor)
    - chart (flexibility in performance)

Take home message

- modelling as the connection between humanities and computing
- potential for editorial methods that better suit (post-)modern scholarship
- importance of active engagement
- now is the time to exert influence on developments

Publishing 15th century music:
Open Access and Digital Editing

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Abstract

During recent years my plans to publish two very different sources of French 15th century music have influenced my views on digital publishing within the framework of the open access conventions. One of these sources contains very simple spiritual music with endless repetitions of the same musical structures, some of them with small but significant variations. The other source contains the most sophisticated secular songs, and the source – an article of luxury adorned with subtle illuminations – is in its entirety a work of art carefully designed for viewing, reading and hearing; and it is at the same time part of a network of relations and meanings involving four similar contemporary sources. Each of the two sources forces in its own way the editor away from traditional means of publishing in cumbersome printed volumes. First one meets the obvious problem of finding financial support for such enterprises, and then the question arises whether the printed edition offers the most adequate presentation of the material or a more flexible presentation better serves the discussions and relations inherent in the sources.

As far as I can see open access publishing will become an unavoidable constituent of the future of the humanities. Before long the tendency will prevail to demand open access of all publicly financed research and of projects with support from foundations. Maybe Denmark will join this development later than its neighbours, but it will happen. Thinking open access may also influence the scholarly process – I should welcome a greater readiness to make preliminary editions available to the public, to invite informed commentary, and to keep an open mind concerning unexpected co-operation or co-editing in order to cross boundaries – also in relation to scholarship outside musicology.

New technologies promise to refine the process of digital editing and to facilitate the user’s navigation through the jungle of different versions of music in the sources, but in reality there is no reason to wait for such developments to mature. In many cases standard applications are fully capable of doing the job of presenting musical editions on the Internet. It is, however, advisable to maintain the data behind the presentations (databases and xml-files) in order to be able to explore the possibilities of future applications.

The first outcomes of both publishing projects are available on my homepage in preliminary editions, http://www.pwch.dk/
To me, digital editing is something that has grown from a field of activity, which I have loved and worked with for nearly forty years. In the early years pencil, ruler and music paper were the tools to use before musical scores went to the professional typesetter. Years later I had to struggle to learn myself typesetting music on a computer, and later again it became a sort of professional career to edit and typeset music of every sort for publication (church, chamber and symphonic music, traditional and avant-garde). During recent years my attention has turned more and more towards publishing on the Internet. My interest in this channel of publishing, which is open to every user and in principle unlimited in scope, has been fuelled by the nature of the sources that I am studying and want to edit. The main reason is of course that digital publishing offers much better possibilities of adequate presentations of the material, but a growing dissatisfaction with the way in which we usually edit the repertories of the 15th and 16th centuries and especially with the complete works of single composers has also influenced my choice of publication strategies.

This means that I’ve arrived at digital editing through traditional music publishing and that my approach to the digital possibilities is mainly graphical in nature. The future potential of music editions generated from data extracted from the sources and stored in databases, and the development of interactive user interfaces seems to me highly interesting, and I’m sure that new techniques in time will change our thinking of digital editing. On the other hand I don’t think that there is any reason to wait for such developments to mature. In many cases standard applications are fully capable of doing the job of presenting musical editions on the Internet. In my projects I basically use only two different file formats: html for communication through browsers and PDF for the music editions. Both formats of course can and will in some cases be expanded with interactive functions and multilayer presentations, but in principle they are static, and their contents must from time to time be updated from the data behind the presentations. The important thing is to begin publishing music (as well as scholarly articles or books) on the Internet according to the standards of open access.

I shall not say much about the principles governing open access publishing and the open access declarations, which still more universities and institutions are signing. The easiest way of getting information on this subject is to consult the very informative web page managed by Søren Dorch at the Royal Library, Copenhagen (http://www.kb.dk/en/kub/open-access). To the musicologist it is of great importance that publishing music in scholarly editions on the Internet makes the effort far more visible – searchable in Google and other search engines – and useful for many more users than if published in expensive volumes, which end up standing shoulder by shoulder on the shelves of a few central libraries. Moreover it is probable that research published in this way will have a higher impact factor, a greater exposure, than if published in library editions. This has been the case in the natural sciences where articles published in open access channels get more citations (by about a factor 2) than articles in journals demanding high fees for admission to either the printed or the digital version.

Even if the political climate in Denmark at the moment is not very favourable to open access publishing – politicians apparently only appreciate heavy volumes published by multinational publishing houses – I’m sure that in the future open access publishing will become unavoidable also in the hu-
manities. As is already happening in other countries, open access will be demanded of all publicly founded research and of projects with support from private foundations.

The discussion following The New Josquin Edition has touched a tender spot in musical editing. Here we can observe how the authority of the monumental edition, the exacting philological standards in research and the wish to present only the absolute truth have made the composer Josquin Desprez fade away in favour of an abstract idealized picture of a composer, which his contemporaries hardly would be able to recognize (cf. further Rob C. Wegman’s article ‘Who Was Josquin?’ in Richard Sherr (ed.): The Josquin Companion. Oxford 2000, pp. 21-50). This edition was meant to be an up-to-date tool for research in the music of an important composer. Instead we got a monument celebrating a generation of Josquin scholars, their aspirations and their dreams of a genius and the perfect, autonomous musical work. The fame and the mythologizing of Josquin during his own time and the following generations are real elements of his musical influence, but such slippery data are not wanted as aspects of a perfect edition. Substantial parts of what 16th-century musicians heard, sang, admired and were influenced by have simply been edited away as false and not significant for an understanding of the “real Josquin”.

The old Josquin-edition by Smijers and his successors depended heavily on prints by Petrucci and later 16th century publishers, the sources which to a great extend were responsible for creating Josquin’s reputation, and therefore this edition in spite of its shortcomings is still valuable. Let us have these sources in new scholarly editions – a new cheap edition of the Harmonice musices Odhecaton has recently appeared (ed. by David Fallows et al., Watertown MA, Amherst Early Music Inc. 2005), and in 2003 Motetti De Passione, De Cruce, De Sacramento, De Beata Virgine Et Huiusmodi B from 1503 was edited by Warren Drake in the series Monuments of Renaissance Music (University of Chicago Press); more are probably forthcoming in big volumes. One has to recognize that Josquin was the first really medialized composer.

The solution to the deficiencies of the opera omnia editions may be to direct greater attention towards research in and publication of single sources. Here digital publishing has a lot to offer, first and foremost in the shape of facsimile editions and in the future also music editions, I hope. One of the great benefits of the technological evolution is the easy accessible digital facsimiles of musical sources on the Internet. The Royal Library in Copenhagen was among the first to offer this service. In my area of study the facsimile of The Copenhagen Chansonnier was widely admired and made several colleagues rather jealous (http://www.kb.dk/permalink/2006/manus/702/eng/). In the same genre I want to mention the high quality facsimiles published by the Wolfenbüttel and Sankt Gallen libraries (http://diglib.hab.de/wdb.php?dir=mss/287-extrav and http://www.cesg.unifr.ch/fr/index.htm). I would also like to mention the very impressive work by a single man and his digital camera, the monk Jean-Pierre Voutaz, who made nearly all of the manuscripts in the library of the monastery in the Alps, the famous Grand-Saint-Bernard, accessible on the Internet (http://www.gsbernard.ch/index.php?page=manuscrits-du-gd-st-bernard). He did send me a CD with two of the manuscripts before their publication. It was a great help, as were all the other web facsimiles. In the two publishing projects, which I shall describe below, I’ve made links to facsimiles wherever possible (permalink links are a great feature). The second project in fact builds on the user’s simultaneous access to the facsimile as well as to the modern edition.

It is important to analyze and edit sources in their entirety, to look at certain sources as independent works of art in which texts, music, illuminations, the writing and binding as well as the composition and
planning of the repertory create an artistic whole. The Copenhagen Chansonnier is such a source. In this field Knud Jeppesen was a sort of pioneer when in 1927 he published the chansonnier complete exactly as he read it on the pages of the manuscript. In his time there were not strong traditions for this sort of editing. It was primarily found in connection with the big manuscripts of early – mostly anonymous – medieval music. However, at the turn of the 19th century there were certain movements in this direction including music of the 15th and 16th centuries, especially in France. For example Henry Expert’s monumental series Les Maîtres Musiciens de la Renaissance Française did include as volume 5 a complete edition of one of Attaingnant’s printed chansonniers (Paris 1897). Later the publishing of works by single composers became predominant. One could say that the aesthetic of the musical work won the market from the aesthetic of the source.

The wish to publish complete musical sources has returned. They appear as facsimiles and as transcriptions in printed editions, heavy and difficult to handle, and difficult to use if one wishes to compare composers or repertories. A good example is the new edition by Rebecca Gerber of the famous manuscript known as Trent 88 from the 1460s (Sacred Music from the Cathedral of Trent. Trent, Museo Provinciale d’arte, Codex 1375 (olim 88). Edited and with an Introduction by Rebecca L. Gerber, (Monuments of Renaissance Music XII) Chicago 2007). It is like a slab of marble. I hope that some day the prestige of open access publishing can keep up with such an edition, that an editor could get the same sort of heavyweight support from foundations for a publication on the Internet. Most copies of this book will never leave the reading rooms of libraries, and therefore it will not really be used for teaching students at universities about the context for the famous masterpieces. It is a shame, because it is an important publication. Not because it contains a new, very good edition of Du Fay’s famous Missa Se la face ay pale or of Ockeghem’s just as famous Caput-mass, but because it includes a wealth of anonymous music, mass sections and complete cycles. Most of its music has only been known to experts with access to the manuscript or to the rare facsimile edition. Now we can study the famous compositions and the anonymous music side by side and in context. But it is not very practical!

Digital edition and open access can change that. Sources can be presented complete, and the user can navigate freely in the repertory, and with many sources made accessible the user can make his own selections of repertory according to genre, to subject matter, to gender etc. – to find his own path through the music in order to map the context. Digital editions may help to bring the study of musical context at level with the work-oriented research.

There is a tendency to regard the expansion of research using open access publishing as a technical problem: When the technological development at some point in the future is able to offer a perfect interactive user interface, the user will become able to participate in the process of scholarly editing as an equal partner. With all sources online the user should be able to produce own editions of needed music. This will hardly be the case. As everyone knows, scholarly editing is a highly specialized process only mastered by few. Today the knowledge and experience required for greater editorial ventures is only found in groups of scholars including several different areas of expertise. Open access research is rather an attitude towards research, which in principle is independent of technology, even if the idea of course is based on fast communication – it is difficult to keep a process open using snail mail. It is primarily about creating competent groups of scholars, about pre-publishing results, and incorporating reactions and discussions in final results – about using the technology and the net in an open process.
Now to a short description of two of my own projects concerning digital open access publishing of music:

The first concerns a complete edition of the polyphonic music in Amiens, Bibliothèque Centrale Louis Aragon, MS 162 D, a mixed collection containing music sections as well as two incomplete missals. The music MS can be dated to the years just after 1500, and it was probably executed for a confraternity associated with the great Benedictine Abbey in Corbie near Amiens in Northern France. Originally the contents of the music MS were carefully planned. A booklet of four fascicles contains three- and two-part simple music for funerals or commemoration, which probably were copied from several sources. The texts and some tunes are known from other French monastic sources from the second half of the 15th century. Before long this small manuscript was enlarged with a collection of two-part sequences. Another section was intended for monophonic music including a mass for St. Catherine. With some pieces left unfinished the intended order broke down and music was randomly added on empty spaces and pages. All hands in the MS were trained in copying liturgical books with plainchant – the two original copyists were probably professionals – and a later hand apparently only copied the visual appearance of some pieces of mensural music having no real understanding of the notation.

The repertory of polyphony for funerals and commemoration is especially interesting. It points to a neglected music of the second part of the 15th century, a period when composers became professionals and famous artists – with names as Du Fay, Ockeghem, Busnoys, Obrecht and Josquin as standard bearers for generations of musicians. The very simple polyphony survived beside this explosion of art music. Most often as improvised music, not recorded in notation, as cantus super librum, but in a few happy instances – as in this MS – also written down for singers who did not have sufficient musical education to improvise polyphony, not even the simplest. The MS lets us glimpse the stylistic breadth of simple music with roots far back in time, and it demonstrates the solemn sound of the prayer, to which the “great” sacred music as an important part of its means of expression so often associates.

It is important to study this repertory, and of course an edition is needed for the purpose. Examples of simple polyphony have been published, usually just as examples in shortened versions. For my project the point is to study the entire range of styles. As this MS does not use any sort of abbreviation of the texts and music – it was written for singers who in fact could not read music, could not improvise, and could not sing their parts from only the text of the following stanzas – everything is written out in full. An edition in score runs to many pages containing nearly identical music, and I’ve never even though about raising the money for a publication in a printed volume.

From the start my plan has been to publish one or two articles on the MS including a few music examples, but also at the same time to refer the reader to the Internet edition (http://amiens.pwch.dk/). It gives a great freedom in the investigation of the highly interesting changes, which were made on the pages of the MS during use of the music, to be able to refer to a complete edition made without the restrictions caused by considerations of space. The edition also contains all the related settings in other sources from the same sort of milieu, primarily monasteries, which use the same texts or tunes. This also serves to place the MS in its context. As mentioned, the MS contains some additions in mensural

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5 A longer version of this description can be found on the Internet: http://www.pwch.dk/Publications/Amiens2007Conf.html
notation, small spiritual pieces. It has been fun and important for the discussion of the dating of the additions to have room for publishing different versions of certain pieces.

As examples I will show you first the long three-part setting in simple polyphony of a trope for *Libera me*, “Juxta corpus spiritus stetit” (Amiens MS 162 D, ff. 18v-28), namely the first two openings of the song as they appear in the MS and the same two stanzas in the edition (see Examples 1-2 and the Edition no. 5). It goes on for ten stanzas in all. We find a related two-part setting of the same text and tune in a MS from the Augustinian monastery Grand-Saint-Bernard, where it is still kept today in Bibliothèque de l’Hospice as MS 6 (pp. 208-213; see the digital facsimile and the edition). This setting contains in all 8 stanzas supplemented with extra 7 responsory verses.

Example 1, Amiens, MS 162 D ff. 18v-19 “Juxta corpus spiritus stetit” a 3, stanza 1.
The second example consists in all the versions of the very simple three or four-part Italian song “La grant pena que io sento” (Amiens MS 162 D, f. 1, Washington, Library of Congress, M.2.1. L25 Case (Laborde Chansonnier), ff. 137v-138, Copenhagen, Royal Library, MS Ny kgl. Saml. 1848 2°, p. 403 and p. 411, and St. Gallen, Stiftsbibliothek, Cod. 462, p. 102, see Edition no. 19), which is only known from sources copied in France. The text and the tune is nearly the same in all of them, but the settings are so flexible and free that they could be different notations of an orally transmitted song. The song shares this condition with a lot of settings of popular tunes and with the repertory of simple sacred music.

The edition is completely traditional. It will be available as a digital music edition in one volume with indices, description of the source and editorial apparatus (as a single PDF file) – there will be more than a hundred pages of music, but during the work I’ve stopped counting the pages. But you can also download all pieces individually. They will be accessible from a page also containing links to facsimile editions of some of the sources. The use of digital editing and open access publishing gives us a chance to study music, which never had any ambition of being art or a “work”, and to let it contribute to a more balanced description of 15th century music.
The second project is a complete edition of a French chansonnier in The Royal Library, Copenhagen, MS Thott 291 8° (The Copenhagen Chansonnier – around 1470) with full editions of the concordances in the related sources, the so-called “Loire Valley” chansonniers:

It is a small vellum manuscript bound in mauve velvet, which contains a repertory of the most sophisticated secular songs, 33 in number. All songs are anonymous in the MS, but many can be identified as composition by Busnoys, Ockeghem, Morton, Hayne van Ghizeghem, Delahaye and others. This article of luxury is adorned with subtle illuminations and it is a work of art carefully designed for viewing, reading as well as for hearing. At the same time it is part of a network of relations and meanings involving four similar chansonniers from the 1460s and 1470s. Knud Jeppesen described this repertory as Burgundian, but recent research has shown that at least the illuminations in the chansonniers were executed in the workshops of the Loire Valley with Tours as the main centre, and that the manuscripts all belong to a central French courtly culture. I use the following abbreviations for the manuscripts:

- Copenhagen – Copenhagen, The Royal Library, MS Thott 291 8° (Copenhagen Chansonnier),
- Dijon – Dijon, Bibliothèque Municipale, Ms. 517 (Dijon Chansonnier),
- Nivelle – Paris, Bibliothèque nationale, Rés. Vmc. ms. 57 (Chansonnier Nivelle de la Chaussée),
- Laborde – Washington D.C., Library of Congress, MS M2.1 L25 Case (Laborde Chansonnier), and

An extraordinary aspect of this group of sources is that most of the Dijon chansonnier, all of Copenhagen and sections of the Laborde chansonnier were copied by the same scribe, usually named the Dijon scribe.

My first example from the Copenhagen Chansonnier is a rondeau by the little known composer Delahaye, maybe a Johannes or Jean who lived in Tours in the Loire Valley in the middle of the 15th century – nothing is sure about the identity of the composer. The chanson is a rather anxious declaration of love. The poet asks about his standing in the heart of the chosen lady “Comment suis je dans vostre cueur”. The song is found in three of the related manuscripts, in Nivelle Chansonnier, in Dijon, and it opens the Copenhagen Chansonnier (http://chansonniers.pwch.dk/CH/CH001.html). In Copenhagen it is beautifully written and adorned with grotesque illuminated letters of high quality, which act as entertaining identifiers (making it easy to find a certain song again) and maybe as oblique comments to the text and the genre. In the superius we see a figure holding forward its heart, rather accommodating, but the figure itself is some sort of hybrid between a human, a fish and a snail. The person at the tenor looks like a thief with a big sack rising up from a flower – has he stolen the heart? –, and the contra-tenor is a hand playing a wind instrument. There are rich opportunities for interpretation of the illuminations (see http://www.kb.dk/permalink/2006/manus/702/dan/0+verso/ and the following page).

I present the rondeau in score with text laid under all voices and the repetition of the half-stanzas of the rondeau fully written out. This repetition presents in many cases a problem during performances. It often has several possible solutions, which need to be considered in the edition. My edition is in a way a close reading of the source, an analysis of the relations between text and music, and a performance in score – but that is a different discussion. Indications of incipits, voice ranges, ligatures, coloration, etc.
along with the usual editorial remarks are a matter of course. The edition unites a critical source edition with a practical edition. Everything needed according to my experience for a performance is present, and it is possible to reconstruct the source’s notation from the text and the notes added on the pages. This is rather uncomplicated to implement as the edition in principle only relates to one source. In this case, however, we have three sources for the chanson, and all three are edited in exactly the same way and accessible from the chanson’s main page on the site, which also contains discussions of style and expression and of the relations between the sources.

This song is a bit special because the results of the three editions of the individual sources become nearly identical. Most users will not be able to see much difference between them, and fewer will hear any differences in performances of the different versions. Why then publish all three versions? This question has several answers. Here I will only try to give one of them.

First take a look of how alike the beginnings of the three versions are: Copenhagen, Dijon and Nivelle (click the start of the three files in http://chansonniers.pwch.dk/CH/CH001all.pdf). Then let us concentrate on what in fact are the main differences between them, namely the copyists’ use of key signatures: Copenhagen has a flat only in the tenor, Dijon a flat only in the contratenor, and Nivelle has B-flats in both tenor and contratenor, and a flat before the high f”” in the superius. The differences in the use of key signatures could very well be caused by an uncertainty in the perception of a characteristic passage by the Dijon scribe, who copied two of the versions: first in Dijon Chansonnier, and later in the Copenhagen Chansonnier as a more careful and concentrated piece of work.

The passage in question is bars 14-19 at the start of the second section of the rondeau. Here we find in the superius and tenor duet two movements to cadences on A (at b. 16.3 and b. 19.1), in which tenor and superius the second time exchange cadential functions. The edition in score leaves no doubt that these cadence movements must be Phrygian and involve B-flats; just look at the repeated f’s in the contratenor and the repeated melodic curve from f”” to a’ in the superius (Example 3). But if you sing one of the upper parts from a single voice part – that is the condition when performing from the original notation – using the version in the Dijon Chansonnier, you could begin to think that this passage possibly should function as a contrasting line of music with cadences on A involving B-naturals and F- and G-sharps, especially as the two semibreves sounding B-flat in the cadences provoke normally forbidden diminished fifths with the contratenor. If the lines are performed that way the fifths become perfect (marked with blue arrows, see Example 3), but you will run into a lot of other problems involving melodic tritones from F to B-natural. The Dijon version is not the best starting point for a performance, but the singers will presumably reach the same solution as the editor after repeated tryouts.

Example 3, Dijon Chansonnier, no. 61, ff. 71v-73 “La plus bruiant”, bb. 15-19
In the Copenhagen version, which does not show any writing errors at all, the same scribe has changed his mind. Now the key signature of one flat has moved to the tenor and clearly indicates what is expected in most cases. We don’t know which signatures his model for copying had, but it is certainly possible that the scribe decided on this correction himself – maybe after trying to sing or think through the chanson. It would not be a problem to omit the B-flat in the contratotenor, as nobody in their right mind would sing B-naturals here.

The independent source, the Nivelle Chansonnier, gives us flats in both low voices, and the copyist repeats the flat before the high b’ in the tenor in bar 15; there can be no doubt that the flats in the tenor are intended. He also puts a flat before the high f” in the signature of the superius, which clearly indicates the use of the high, fictive hexachord on e” – and no use of E-flats! The question is then if this signature could convince a singer to sing B-naturals in this passage and hereby cause a dramatic shift in the harmony – we don’t know the answer. This ambiguity is however part of the aesthetics and charm of the 15th century chanson.

I could chose to offer only one PDF-file containing all three versions of the chanson by exploring the PDF-format’s possibility of storing different layers. Either three layers each containing a complete version of the chanson, which the user could chose between using internal links, or only one complete version with the variants in small overlays. In the last case I would have to select one version as the most accurate or original, as the one “nearest the intentions of the composer”. In this repertory I would soon get into serious trouble – of the kind which mars the New Josquin Edition. The choice of independent, possibly nearly identical editions of all versions reflects my wish to present an integral source (the Copenhagen Chansonnier) without any aggregations of foreign data and to take its musical testimony at face value. Also I want the separate editions for a discussion of the relations to the other sources – keeping an option open to build a presentation of one or more of the related sources some day.

My final example is the refined anonymous bergerette “La plus bruiant, celle qui toutes passe”, which only appears in the Dijon and Copenhagen Chansonniers, that is, copied by the same scribe within a few years (http://chansonniers.pwch.dk/CH/CH029.html). It is a courtly chanson, which uses terms from contemporary musical theory to put the traditional lover’s complaint into words. The poet praises the most perfect lady “in a fictional hexachord lowering the natural B-quadratum” (muant nature en becarré la basse) and moves his “scale to another range”, joining his high hexachord “to a foreign one”. The music is consciously made to illustrate the theoretical terms of the text. Alone the key signatures give some hints. Like the first chanson the superius has a flat before f” along with a normal B-flat, tenor has one flat, and contratotenor two flats. The flat before f” makes one again expect the sound of a high fictive hexachord on e” including the major third (mi = e’); but in fact most E’s in the song’s first part have to be lowered to E-flat – the singer changes his high hexachord into a foreign musica falsa, a hexachord on b-flat’.

The version in Copenhagen Chansonnier has only the usual editorial problems (they are difficult enough). The slightly older version in Dijon Chansonnier shows several difficulties. The copyist encountered big problems in fitting the two couplets, which characterize the form of the bergerette, with text. The two lines in the poem apparently seemed too short, because he did not realize that the tenor defines the text declamation in this section. He repeated some words and added a short line “a ma
chante pleure” stretching the text so much that it could be placed also below the short bridge passage back to the first part of the song, which is copied without text in the Copenhagen Chansonnier (see p. 3b in http://chansonniers.pwch.dk/CH/CH029D061.pdf).

The edition with text in all three voices shows that the Dijon scribe’s attempt to revise the couplets was unnecessary, which he as well realized in the version he made in the Copenhagen Chansonnier. But the words “A ma chante pleure” are intriguing, and I have kept them as a possible text for the bridge, which by its triplets precisely indicates the return to the correct tempo for the semibreves in tempus perfectum in the first part of the bergerette.

The use of musical terms brings up associations to the poems of Charles d’Orléans who often used such terminology. His mother, Valentina Visconti, widow of duke Louis who was murdered in 1407, took as her emblem a picture of a chantepleure, a sort of watering can pouring out big tears. It is a picture of desolation, well known and admired in contemporary society – and absolutely fitting for the chanson, even if it was added by a scribe in want of a longer text. On the other hand, Chantepleure also was a dance song in popular plays, wild and happy but ending in tears and sorrow, illustrating the course of any damnable but joyous vice.

Again the possibility of publishing both versions of the song in their entirety and being able to view them alternately by a click on the computer makes it much easier for the editor to discuss the music and I hope easier for the user to follow. It also underscores the view that in the 15th century every writing down of a piece of music represents a performance, an interpretation of the sounding reality of the music notated according to contemporary needs and conventions in the scribe’s surroundings.

I probably do not need to mention that this chanson edition is an open project, and that I hope to find interested parties to remedy its limitations – or best of all to go on with the other chansonniers in the group.
The Edirom tools as an approach to digital editions of music from the Common Western Notation period

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Abstract

For the creation of truly digital editions, several things are of great importance. First (and rather self-evident), the editor himself should work with the medium he is writing for. Although this implies a bold change for many editors’ personal workflow, it is certainly the only way to produce contents that are appropriate to and really use the benefits of computers. Furthermore, the editor has to be aware of his altered relation to the reader. He has to provide a different kind of editorial report, which may omit obviousnesses, but has to explain unclear or misleading passages in detail. This implies no threat to the editor’s role, but enforces a change of his writing practice.

To use the full potential of the medium, the whole content of a digital edition should be provided in an operable way. Therefore, the music itself should be adjustable to the user’s needs. This includes real-time conversion of old clefs as well as search functionalities or the variable collation of parallel parts. Especially the last issue seems to be a great problem for music from the 16th century onwards. The complexity of its notational habits requires very sophisticated file formats and displaying algorithms. MusicXML and MEI seem to be worthy approaches for the first problem, but setting notes with all essential diacritical marks is a difficulty still to solve.

The Edirom project, which develops specialized applications for editors and users alike, tries to address these issues. Therefore, different sample editions of music from Dvořák, Schumann and others are prepared and examined. The goal is to provide modular tools for the generation and distribution of digital music editions.
Before talking about computer-based editions, we should have a short look at the terminology we are using. What are digital editions? There are at least two different types of editions, which may be distinguished by the point in the editorial process where computers come into play. In the literature studies they are distinguished as electronic and (born) digital editions.

Electronic editions are some kind of conversion of contents originally made for a printed edition, but now presented in a digital medium. This conversion is often made by technicians that are only counseled by musicologists, but not by the musicologists themselves. Thus, possibly necessary changes to the editorial report are only occasionally made. The main problem is, that the contents – which means the textual parts in this case – are not suited for a digital medium. In traditional printed editions, the variant readings of several witnesses are normally compressed into a list. Whether this kind of editorial report is really usable or not is an open question (with a foreseeable answer...), but it is a compromise that has proved to be sufficient for printed editions. Premising that digital editions provide access to facsimiles of all relevant witnesses, the reader of such an edition will probably not be pleased with such a simple list of variants. Apparently a traditional editorial report has to be modified to fit the new medium.6

For creating truly digital editions, the editor has to consider the medium’s specific needs as soon as he is writing his editorial report. This means he has to work directly within the medium he is writing for. Otherwise he will not achieve a satisfying level of media appropriateness. That being the case, the editor of a digital edition has to be willing to work with computers, which perhaps implies a change of his personal workflow. So there is a need for tools that support the editor and give him the means to work in the new medium. A scientific project that wants to investigate the possibilities of digital edition therefore has to develop applications for both the user and the editor. In our project, which is funded since 2006 (and was recently granted for three more years by the German Research Foundation), we prepared several different editions from Carl Maria von Weber, Antonín Dvořák, Joseph Haydn and Robert Schumann. Editions of music from other composers like Johann Sebastian Bach and Max Reger are currently under consideration. Most of our current editions are only electronical editions, thus being conversions of originally printed editions. The reason for this is that all external7 editions we made are sample editions that shall demonstrate the applicability of our software to specific editorial problems. In addition to the software for displaying electronic or digital editions, we are developing an application that supports the generation of digital editions. We already used some of the tools to prepare our electronic editions of Dvořák, Haydn etc., and currently the Weber-Gesamtausgabe uses it for the preparation of its printed editions of Weber’s Clarinet Concertos. So, even when made for the preparation of digital (and electronic) editions, there is obviously some benefit in using software support for the production of printed editions.

6 It is just the same situation as comparing movies and the novels they are based on. But in the movies, there is a screenwriter who translates the novel to something that fits the new medium better – a screenplay. In most electronic editions, there is no such translation, but only local changes to some of the most obvious issues.
7 There is a very close interaction between the Edirom project and the Weber-Gesamtausgabe, so that all editions of Weber are treated as internal projects.
Language selection of the Edirom

Comparison of sources
Our software is not too impressive from a software developer’s perspective, but we do not even try to develop such an application. What we are trying to do is to find applicable concepts for digital editions, and the software is just a way to get there. The main question is, how scholarly music edition will change due to this (relatively) new medium, and how we can make sure that the scientific quality of our editions keeps more important than some impressing, but misleading technical software features.

Therefore, we have to carefully look at the roles of the editor and the user in the digital medium. Obviously, the user (or reader) gets into an emancipated position. He is no longer dependent on the editor’s descriptions of the sources, he may examine them in nearly the same quality as the editor. So the user comes into the position to collate the sources by himself, to judge what he sees and to come to his own opinion, which is not necessarily the same as the editor’s.

This means that the editor has to justify the decisions he made in the edited text in a different way than before. He has to explain misleading issues that are only fully comprehensible with the experience of an editor. The pure presence of different inks needs no lengthy documentation anymore, but instead the question about the reason and meaning of the different hands will become more important. The focus of editorial reports will probably change; while some aspects will get a lower priority, others will become more important. Especially genetic editions, which have a very sophisticated methodology, but no possibility to achieve their goals within printed books, may benefit from a digital publication. This means that the medium itself encourages the further development of editorial concepts, or at least it takes down some barriers to do so.
Annotations from the Editorial Report can be displayed on the facsimiles. A tooltip offers a first hint of the content.

The annotation may be opened as a separate window where the user gets an overview of all related sources.
The Edirom allows the collation of sources in a very convenient way.

When there is a system or page break, the software will rearrange the bars inline.
As I said, the user comes into a much more emancipated position compared to his former relation to the editor. The editor should react on this new ‘hypermedia freedom’ with a different kind of editorial reports, he will have to reason his decisions and may not skip unclear passages.

During the last few decades, practical musicians started to read the original sources by themselves. Although reading old clefs is not that problem anymore, there is still a need for an expert’s knowledge of handwritings and the notational practices of different historic epochs. Many graphical signs changed their meaning over time, and it is an editor’s task to identify and explain the appropriate one. With the general availability of high-quality digitized sources, the readers of an edition may start to think that they are able to read and understand these sources without further assistance. Editors should face this tendency by pointing out the catchier problems of historical sources and thus give the users an understanding of the real complexity of music notation. For the field of music covered by the Edirom project there are quite different problems compared to the area of medieval music. When thinking about opera, the pure amount of source material that has to be considered can get quite extensive. This means that there is much more data which has to be stored and organized as well. So we have to deal with lots of facsimiles, and often enough we have far more voices to care for than in renaissance music. Whereas the complexity of older music mostly comes from the sometimes ambiguous graphical arrangement of a relatively small number of musical signs, music from the Common Western Notation period bases on a largely increased number of symbols.
Although today’s musicians are very familiar with these signs, they still entail an appreciable amount of ambiguity due to their context sensitivity. Especially the increasing number of accidental entries – accidental in the sense of Greg’s Copy Text theory – brings a new kind of difficulties to music notation. There are lots of misleading entries, and many of them are only fully comprehensible with an intimate knowledge of the composer’s notational habits. For the same reasons, the specialities of Common Western Notation also induce greater problems when it comes to displaying high-quality notes on the fly. This is a task our project will try to address within the next few years. Currently, there are no easy to use open-source libraries that give us everything we need for an editorial typesetting of notes. We don’t need to compete with professional music printing applications, but we need the possibility to display diacritical marks in an appropriate quality.

A first step in this direction was the evaluation of different file formats I made during the last year. To achieve fully digital editions, it is really important to have all contents in a processable form. Searching in text is the tritest application of this, and even the handling of facsimiles is not a real problem. For example, there are already solutions for the superimposition of images like the one seen in the OCVE project. In our case, we will try to reuse the code from Laurent Pugin’s Aruspix project, which is quite impressive. But when it comes to the music itself, there is currently no proper solution for complex searching within the music. Of course there are lots of applications that offer searching functionalities, but in our case they often fail due to their lacking support of editorial needs like the consideration of ambiguities, multiple readings and variants. The file formats which seem to be eligible for such a task are MusicXML and MEI, but for none of them there is a tool which offers the needed functionalities.
The main problem of searching in music is the input of search patterns that may cover the whole field of Common Western Notation. I think that we should break down the problems here and perhaps start only with monophonic music or so and later add more possibilities. But first, we have to implement the music itself into our application, which demands a further development of MusicXML and MEI. Currently, a combination of both formats seems to be the best solution, as they are focused on very different things and complement rather well. But I think that discussing the specifics of different file formats and their extensibility is probably not too interesting for this symposium. Again, from an IT perspective, most of the applications developed in the field of digital music edition are not very impressive. The main challenge is not the software, but the content model that has to be matched. Neither music nor editorial processes (in general) have strict rules that might be used as guidelines for software development.

Currently, all bar positions have to be entered manually

If we want to produce accepted software that will be really used, it is most important to examine the workflow of editors. Only when an application resembles their personal approach to editing, they will feel comfortable enough to be willing to switch to a different medium. Keeping the knowledge of editors is most important to ensure the quality of digital editions. For this reason, a mutual exchange between musicologists and technicians seems to be essential. A well-considered and gentle development of generally useful solutions appears to be preferable – at least for our project – as we have to face very different specific problems. We will probably never provide a software that will work optimal in every case, but we try to address the majority of problems in a sufficient and perhaps even satisfying way.
From my perspective, cooperation between different projects is most important, as our discipline will not get the necessary funding for reinventing wheels. We are very interested in sharing our work and experience with other projects, as this will help to improve the coming solutions. We are already in close contact with Stefan Morent’s digital Hildegard von Bingen project and the mentioned Aruspix project, which concerns mostly the music of Luca Marenzio. Furthermore, we are interested in the discussion and development of editorial file formats for music notation, as the usage of the same formats by several projects will probably allow the sharing of modular tools for delimited problems. Combining forces where possible, we may get more room for the discussion of editorial concepts, which should be the premier task of each digital music edition project.