



Minimalism in digital music editing

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in dialogue with Tim Crawford



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Abstract (1/3)

In March 2006, a small group of music researchers met at Royal Holloway for an event entitled 'Modern Methods for Musicology'. I had been invited to speak, and took the opportunity to present some ideas that I had developed during a Visiting Fellowship at Goldsmith's. Basically, the problem I had been working on was this. In the ECOLM project, encodings were being created of lute tablature sources. TabCode, the system designed for this, was very good at capturing the content of the sources, but there were no mechanisms in place for correcting errors, recording variants, in short, for adding text-critical information. Building on some previous experience with editing music treatises using Text Encoding Initiative (TEI) markup, I proposed an extension of TabCode, TabXML, that borrowed (and adapted) a number of text-critical elements from TEI. I also felt that this work needed some theoretical justification, which I found partly in the text editing and encoding community, partly in emerging projects in digital music editing such as CMME (Computerized Mensural Music Editing), DIAMM, OCVE and a couple of others. I had heard about the Music Encoding Initiative (MEI) at the time, but I felt rather unsure about its chances for survival.

These ideas provided the foundation of a 'multidimensional model' for 'digital critical editions of music'. This model represents a composition as a hyperlinked collection of digitised sources (in any relevant medium), encodings, annotations, and contextual links. Lower-dimensional 'views' of the model would represent, for example, a critical commentary, or a particular edition. Multiple editions of the same piece could thus be



Abstract (2/3)

created on top of the same source materials, so that editing could become an incremental (and hopefully more sustainable) process. Also, this model would better serve 'unstable' compositions with a bad fit with the work concept: editing would consist in coordinating multiple sources rather than in creating a single text of the piece.

At the time, I contended that there hadn't been much debate yet about 'the implications of ICT for critical editing and scholarly editions of music' and I hoped that my model would provoke critical reactions and counterproposals as well as attempts to realise it. Whether in response to what I wrote or not, important developments have certainly taken place since then, most notably within the growing MEI community. However, since my research went into a different direction, I haven't participated much in these. This talk presents an opportunity to overview the advances made in digital editing of music, and to discuss how these reflect on the multidimensional model.

The point I would like to focus on in particular is how the idealistic 'maximum' view of what an edition should be modified in order to be practical and sustainable. Taken at face value, the model is prohibitively expensive to implement. There are at least four arguments for striving towards a minimalistic concept of digital editing instead. The first is the cost argument: how is one, in an environment of diminishing funding for humanities research, ever going to create a substantial corpus of editions? Second, and related to this, the success of digital editing depends on the participation of a community of academics and citizen scientists, who may be very motivated to produce editions but



Abstract (3/3)

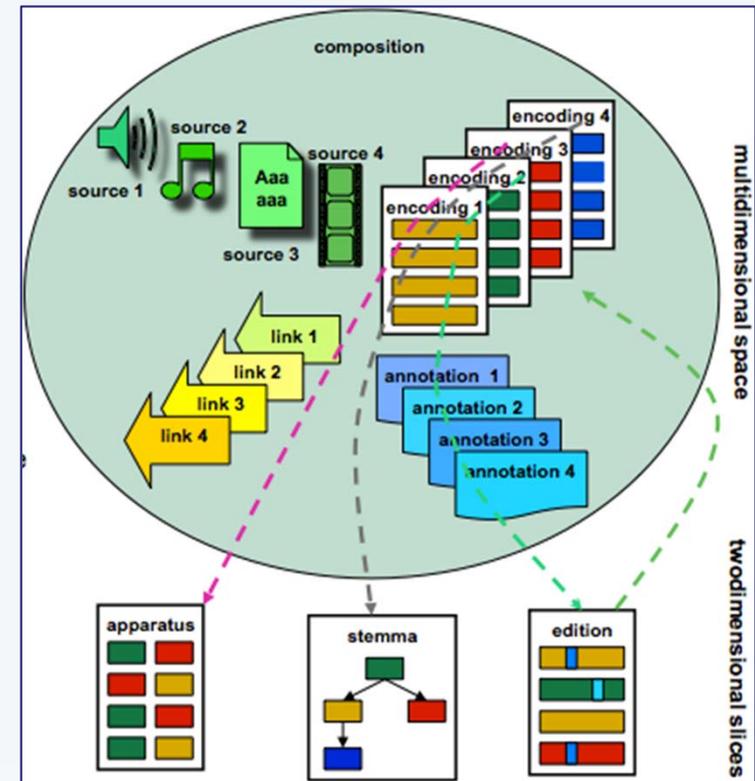
less so to have to undergo extensive training or to perform (apparently) pointless tasks. Third, digital editing implies long-term goals but the more complex a model is, the harder it is to sustain while technology is constantly changing. Finally, the model can be criticised from the perspective of Human Centred Design. This viewpoint approaches the design of new technologies (such as digital editions) not so much as the realisation of technical opportunities but as an answer to human needs, desires (and fears). It is easy to develop visions that maximise the role of technology. For example, there may be a temptation to create extremely detailed markup or to propose a very precise alignment of a network of sources. By doing so one might fall into the trap of Donald Norman's paradox of technology, which states that 'the same technology that simplifies life by providing more functions in each device also complicates life by making the device harder to learn, harder to use'. Is the model suitable for empowering musicology, or does it only add complication?

Today I would advocate minimalism rather than the opposite. But what is the minimal version of a maximal model? At the moment of writing this abstract, I have no firm conclusions yet, nor are these desirable to kick off the discussions at the workshop. I will however present a number of tentative propositions in dialogue with Tim Crawford, who will respond to them from the experiences from the Transforming Musicology project.



From the invitation email

- ...describing some of the gains that have been made since your 2006 comments that 'Unlike in literary studies, the implications of ICT developments for critical editions have hardly been debated in musicology.'
- I wonder just how close we are to having a true 'digital edition' of music rather than a plethora of 'digital resources'.



Digital Critical Editions of Music:
A Multidimensional Model
(2006/9)



Why minimalism?

- digital editing seems to invite complexity
- tradeoff between comprehensiveness and efficiency
- reducing complexity might remove barriers for widespread adoption
- how could we create digital editions at a scale that allows for meaningful big data analysis of music?

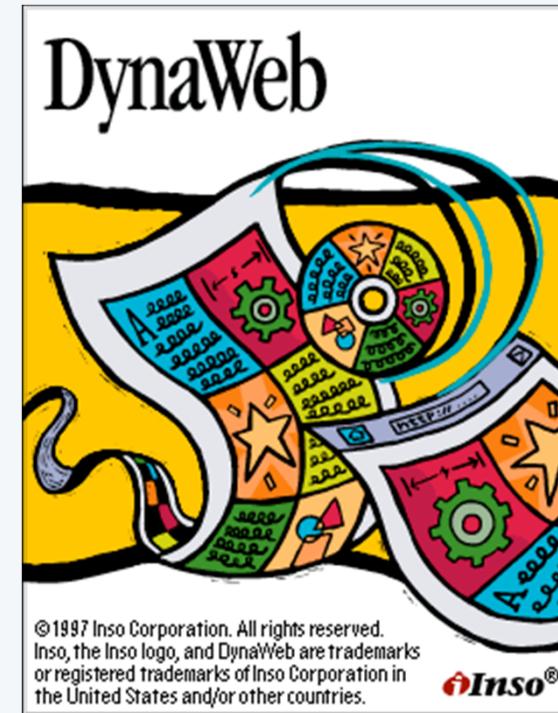




vs.



- Standard Generalized Markup Language
- extremely powerful precursor
 - configurable abstract syntax
 - provisions for 'markup minimization'
 - concurrency: multiple hierarchies
 - mandatory validation through DTD
- software difficult to create, with limited functionality
- effectively wiped out by XML
- in this case, less is certainly more



probably the best SGML publication environment ever († 2002)

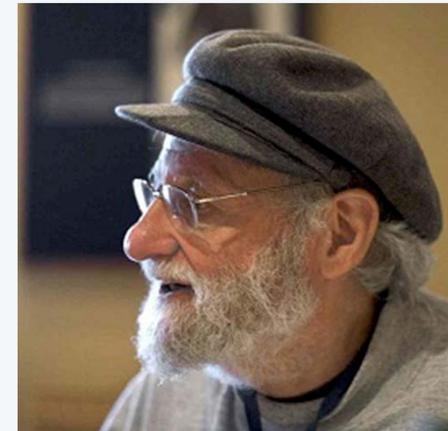


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The Paradox of Technology

Technology offers the potential to make life easier and more enjoyable; each technology provides increased benefits. At the same time, added complexities increase our difficulty and frustration with technology...

Donald Norman, *The Design of Everyday Things* (rev. ed. 2013)



a case of advanced featuritis



Outline of the presentation

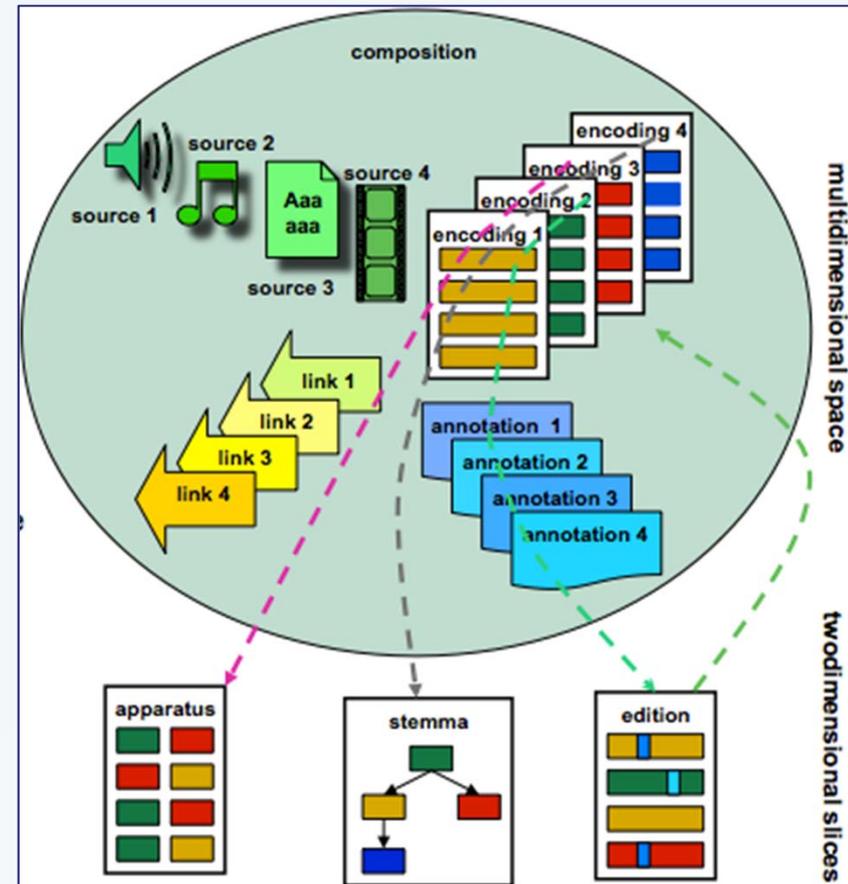
1. the multidimensional model
 - some critical reflection
2. state of the art in digital scholarly music editing
3. minimalism and digital editing
 - in dialogue with Tim – who's allowed to interrupt me at any time



The multidimensional model

a model for editions that

- gives full access to work instances
 - sources
 - encodings
- enriches, coordinates and contextualises these
- allows creation of different meaningful lower-dimensional views
 - e.g. editions



How the model emerged

- motivation
 - information loss in editing
 - usability of critical apparatus
 - lack of transparency in interpretation
 - dealing with variants and work concept
- series of case studies

39/1-2 bl sbr, bl m (*MunSche*); 41/1-2 mi col (*BerGlo, Cop 1848, Dij, FBNC 176, FR 2356, MunSche, NHMel, PBN 4379, PCord, PPix, RCG XIII.27, WLab, Wol 287*); 41/2 c fu, b fu (*RISM 1538^o*); before 42/1 sharp (*NHMel*); 42/3-43/2 bl sbr,

The diagram shows a musical score with 16 numbered vertical bars. The top staff contains notes with slurs and accents. The middle staff contains notes with slurs and accents. The bottom staff contains notes with slurs and accents. The bars are numbered 1 through 16. The notes are 'a', 'e', 'r', 'e'. The bars are shaded in red and pink. The diagram illustrates a series of case studies for a musical model.



Dimensions

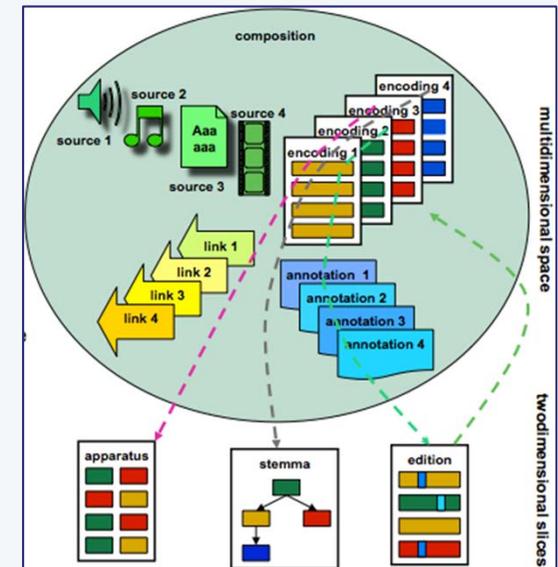
- case studies delivered 'dimensions' of model
 - ordered by (4) SMDL domains
- aim was to be as comprehensive as possible
 - reference model
- full realisation (in a single editorial project) not foreseen

- Visual: written sources
 - problems in source text
 - emendation
 - uncertainty
 - source layers
 - scribal correction (Bach)
 - improvement (Bach)
 - performance alternative (Galilei)
 - explication (Bach)
 - different sources
 - variants (Ockeghem, Weiss)
 - intertextuality (Ockeghem, Bach)
- Logical: edition
 - preference (Bach)
 - adapt to CMN conventions
 - transcription (Ockeghem, Galilei, Weiss)
 - inference (Galilei, Weiss)
- Gestural: performance
 - ensemble composition
 - interpretation
 - recording
- Analytical
 - knowledge (Bach)
 - linking (Ockeghem, Bach)



Some advantages (2009)

- enhances accepted musicological methods
- stores and preserves information
- allows searching, automatic analysis
- multimodality
- adaptation to needs
- incremental and collective creation
- fast and cheap distribution



for drawbacks see the paper,

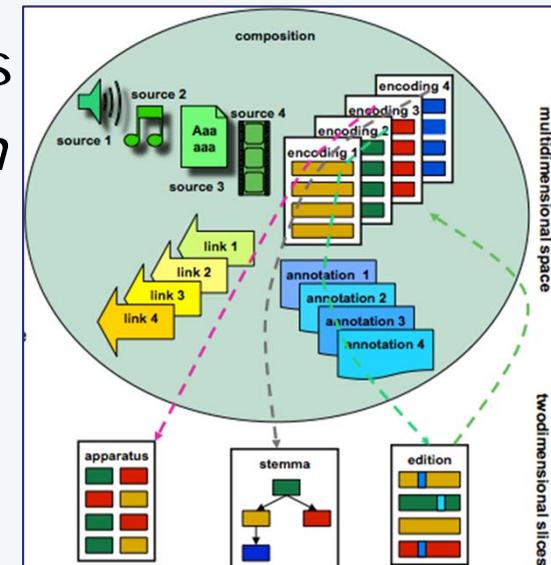
<http://www.methodsnetwork.ac.uk/redist/pdf/wiering.pdf>



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What I now see as weaknesses

- lack of coordination between instances
- focus on encodings, hence on *notation*
- no analysis of / view on editorial work processes
- no analysis of how editions are used in daily practice
- little consideration of the role of software
 - user interface design
 - technical constraints, complexity of processing
 - empowerment, appropriation





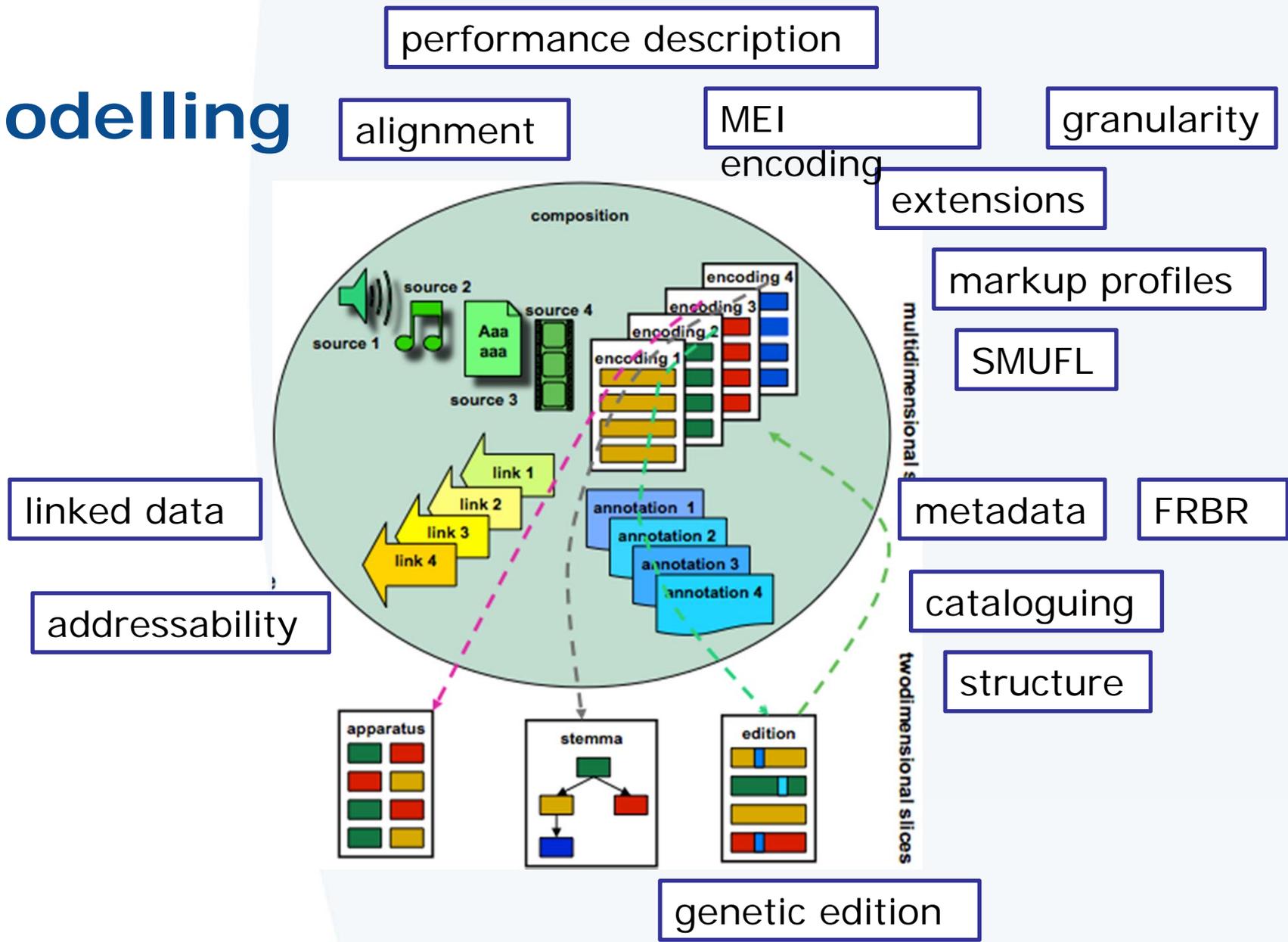
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2. State of the art in digital editing

- based on
 - abstracts of MEC 2015 and 2016
 - various publications
 - project websites
 - overviews such as drm.ccarh.org
- preliminary and selective



Modelling

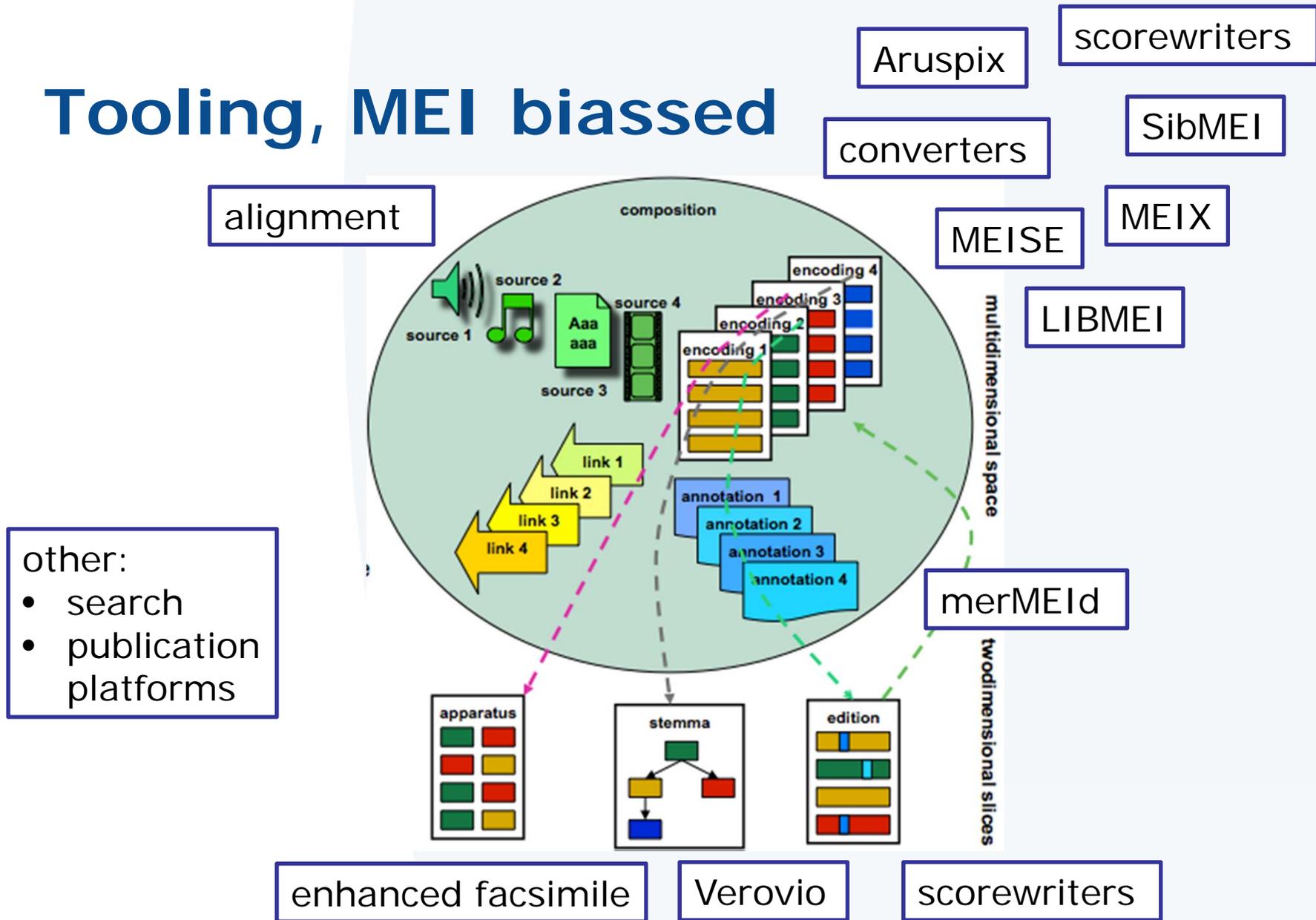


Modelling observations, mainly MEI

- awareness of other standards
- emphasis on encoding of notation and metadata
- modularity
- focus on traditional musicological areas
 - weak in world music, (post) modernism, popular music
- some profiling, driven mainly by processing
- few alternative views proposed



Tooling, MEI biassed



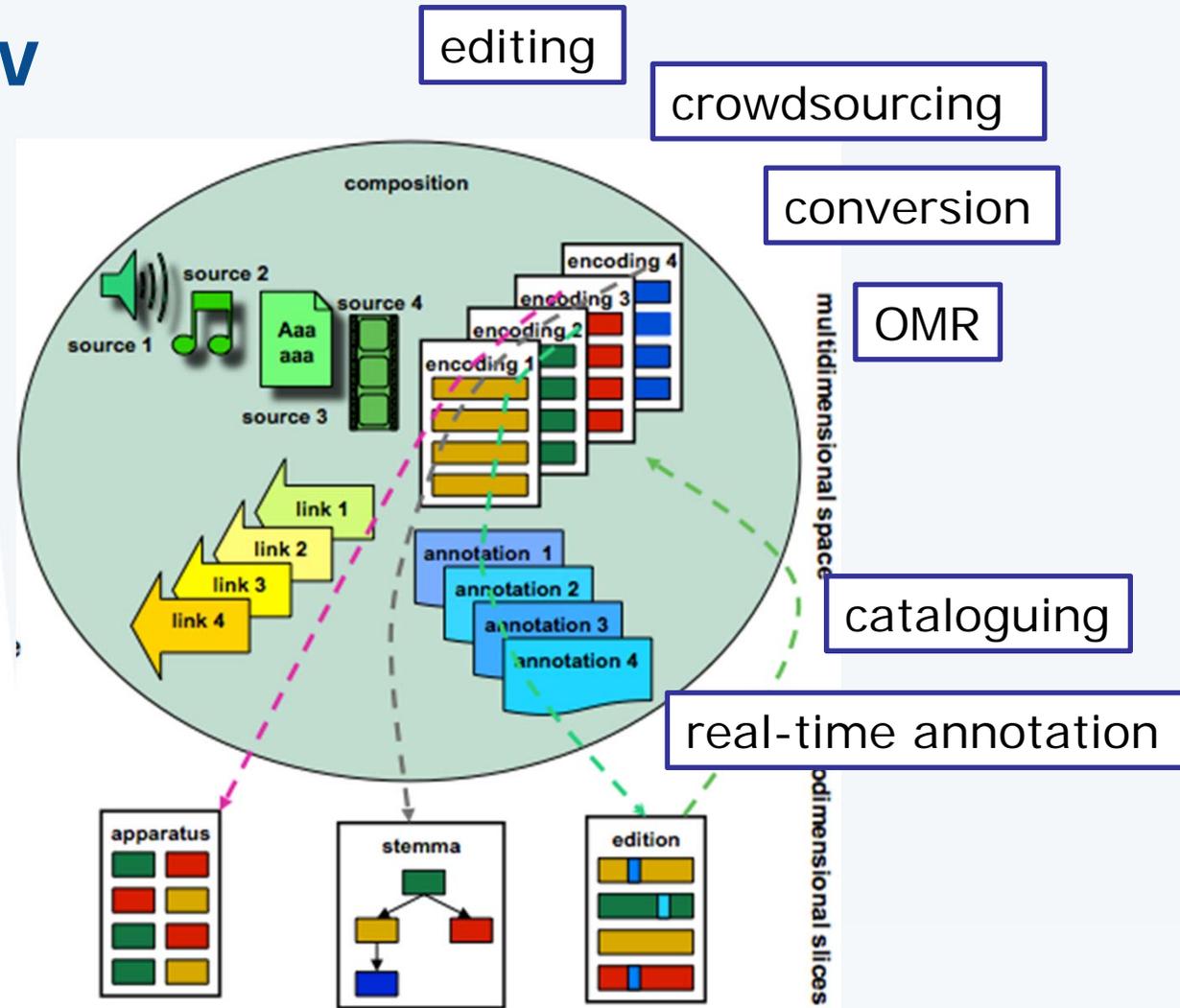
Tooling observations

- mainly support for data production
- strong focus on notation
- important role for interoperability
- new visualisation concepts emerging

- weak on musicological interfaces



Workflow



Workflow observations

- number of workflow components
- experimental complete workflows for edition creation
- opportunities
 - multimedia edition
 - contextualisation



Projects

source

DIAMM

edition

CPDL

IMSLP

TML

CMME

Du Chemin

Josquin

ECOLM

Marenzio

Cantus network

Dutch Song
Chopin or
Weber / Freischütz

Sarti

database

RISM

Detmold court

?chant stuff

Bach-repertorium

hearing Wagner

context

annotation



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Observations about projects

- may not be the best representation
 - encoding projects are left out
 - superprojects hard to fit in
- several peripheral projects added
 - for their potential to develop into editions in the strict sense
- separate class of cataloguing projects
- many projects connect sources to editions
- few projects have extensive contextual information
- ‘critical audio editions’ do not seem to exist



Back to John's email

- 'the implications of ICT developments for critical editions have hardly been debated in musicology'
 - certainly no longer true
 - BUT within a clearly-defined subcommunity,
 - from a rather creation-oriented, technological perspective
 - how to reach out to the musicological community at large?
- 'how close we are to having a true "digital edition" of music rather than a plethora of "digital resources"'
 - relation between work, instance and sketch problematised
 - various conceptions of enrichment emerging
 - technologies seem to be converging
 - not yet possible to describe digital editions as a genre
- if 'big data' creation is a promise, then we're still very far from fulfilling it





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Maximalism

- comprehensive models are very seductive
 - (nearly) every feature can be accounted for
 - anyone's wishes can be accommodated
 - the optional may quickly become the norm
- this comes at a cost
 - implementation difficulties
 - inconsistencies
 - time-consuming and expensive to create
 - who's going to benefit?
 - losing focus
- how can we create mechanisms that help us to focus?
 - hence take closer look at minimalism

E ben **<orig reg="v">u</orig>**ero che 'l mio dotto **<persname key="gali.vinc">Discepolo</persname>** nel suo **<title>Trattato</title>**, à questo proposito dice: **<quote>Considerate se un'Istrumento fatto d'un stinco di Grue, d'A**<orig reg="v">u</orig>**oltore, ò d'Aquila è, atto à percuotere gli Huomini, & togli la vita: **<xptr doc="gali.vinc-dia" from="id(p100)"></quote>****

haurebbe tolto la uita; non può essere à questo c'ho detto contrario: E ben uero che'l mio dotto Discepolo nel suo Trattato, à questo proposito dice: *Considerate se un' Istrumento fatto d'un stinco di Grue d' Aoltore, è d' Aquila è, atto à, percuotere gli Huomini, & togli la uita: Et in cò non dice male; quando non*

Deep encoding
example from
TMI



CMME

The screenshot displays the CMME (Computerized Mensural Music Editing) software interface. The main window shows a musical score for "Missa Paschalis 'ad organum' Kyrie" by Heinrich Isaac. The score is presented in mensural notation across four staves (Soprano, Alto, Tenor, Bass). The interface includes a menu bar with "File", "View", and "Versions". A toolbar contains playback controls and a search icon. A "PLAY" button and "Version: Dumitrescu" are visible in the top right. On the left, a "Versions" panel lists variant types: "All variants" (selected) and "Selected variant types" (Non substantive, Rhythm, Pitch, Text, Accidental, Clef, Line-break, Coloration, Ligature, Mensuration). Below this, a list of variants is shown, including "Dumitrescu" and "Occo Codex" for various measures (8, 10, 12). Two pop-up windows are open: "V3, m. 12" showing "Variant type: Coloration" with three options (Dumitrescu, Occo Codex, VierNB Mus. 18745, BudOS 22) and "V4, m. 8" showing "Variant type: Rhythm / Coloration" with three options (Dumitrescu, Occo Codex, VierNB Mus. 18745). A "Commentary" section at the bottom indicates "No commentary selected".

Computerized Mensural Music Editing, www.cmme.org



CMME focus

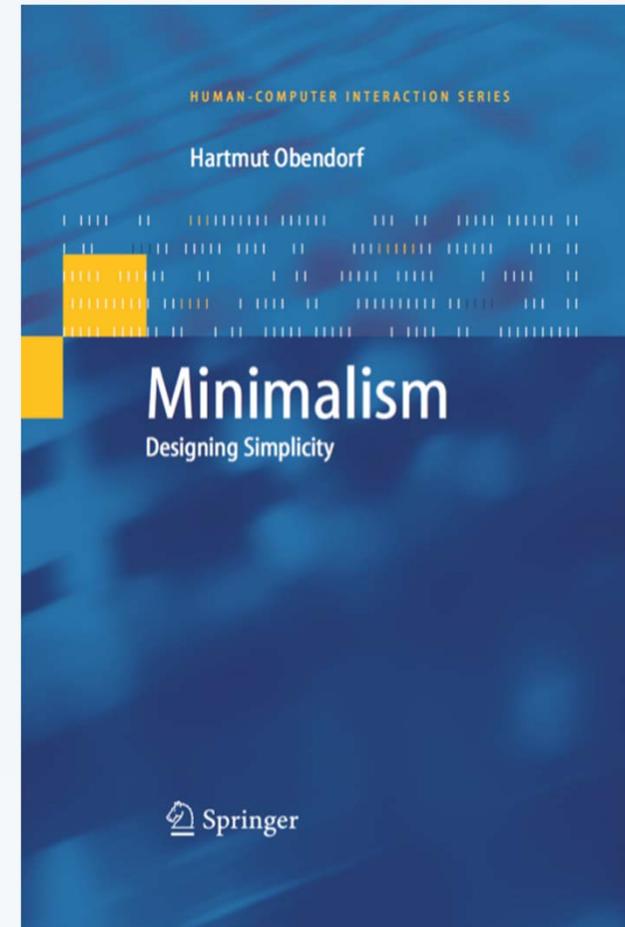
- created from a strong vision of what a digital critical edition should be
 - related to materiality of Renaissance polyphonic sources (Dumitrescu 2009)
- encoding and software developed together
 - lightweight encoding, hidden from user
- my own CMME experience
 - easy to focus on the editorial work
 - technology becomes transparent
- design workflows
 - CMME: goals \leftrightarrow functionality \leftrightarrow technology
 - MEI: goals \leftrightarrow technology \leftrightarrow functionality



Simplicity and minimalism

Simple, powerful systems are an ideal of interaction design—and hard to find in the world. Reduction is the path to simplicity, and minimalism describes paths to approach reduction... As the ultimate thought model, minimalism is a tool to think about the simple and to discover and instantiate patterns for designing simplicity.

Hartmut Obendorf, *Minimalism: Designing Simplicity*. Springer, 2009. p. ix.



Why minimalism?

- the “digital revolution”... has contributed additional layers of complexity to our lives, even though it set out to make work faster and simpler...
- focus shifted... to reducing the complexity for the end user and ensuring his/her being in command of the procedures employed
- Design aims to create interactive systems so simple that they are no longer recognizable as systems, but fade into the background, quietly enhancing our abilities.

Obendorf 2009, p. 3



Minimalism in art and music

- ...ideal candidates for an examination of the meaning of minimalism... it could be said that they are ahead of their time... and often anticipate changes that other parts of our culture will take years to experience (p. 17)
- five concepts of minimalism (ch. 2)
 - *minimality of means*
 - *minimality of meaning*
 - *minimality of structure*
 - *use of patterns*
 - *involvement of the recipient*



Frank Stella, Zambezi



Terry Riley, In C



Minimalism in design

- in interface design, extreme minimalism is often undesirable
- lower border is the complexity of the task



Obendorf 2009, p. 7, 9



functional minimalism

- reduction in accessible functionality
→ focus on core functionality
- Obendorf's examples
 - sushi knives
 - Apple GarageBand 1.0



functional minimalism: chordify.net

The screenshot displays the chordify.net interface for the song "Freedom! '90" by George Michael. The page features a navigation menu on the left with options like "Log in", "Create Account", "Library", "Premium", "Blog", "Help", "iOS App", and "Feedback". The main content area shows the song title, a search bar, and a set of controls including "TRANPOSE", "CAPO", "TEMPO", "SONG", "CHORDS", "MIDI", and "PRINT". Below these controls is a grid of chords for each measure of the song. The chords are: C, B_b, F, C, B_b, F, C, B_b, F, C, G, F, C. At the bottom, there is a section titled "Similar to George Michael - Freedom! '90" with four video thumbnails for "White Light", "Someb...", "Careless Whispe...", and "One More Try".

Measure	Chord
1	C
2	B _b
3	F
4	C
5	B _b
6	F
7	C
8	B _b
9	F
10	C
11	G
12	F
13	C



structural minimalism

- reduction in *perceived access structure*
 - contextualization of complex functionality
- Obendorf's examples:
 - Apple Front Row remote
 - Palm Pilot
 - Word 2007



structural minimalism

Themefinder
[[About](#) | [Search options](#) | [Help](#)]
[[New Links](#) | [Composers](#) | [Random](#)]

[Take the Quartet Quiz](#)

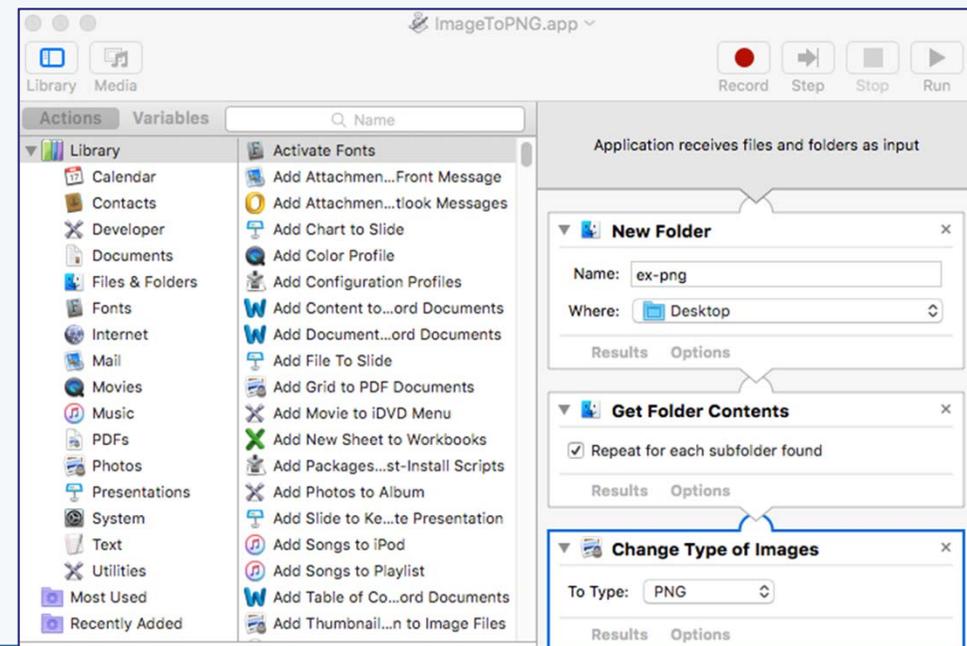
Repertory	<input type="text" value="ALL"/>	? type of music to search
Pitch	<input type="text"/>	? A-G, sharp=#, flat=- e.g. C E- G F#
Interval	<input type="text" value="+m2 +M2 P1 -M2 -"/>	? maj=M, min=m, aug=A, dim=d per=P, fifth=5, up=+, down=-. e.g. +m9 -P8 +M3 P1
Scale Degree	<input type="text"/>	? do=1, re=2, mi=3, fa=4, so=5, la=6, ti=7 (mode insensitive). e.g. 34554321
Gross Contour	<input type="text"/>	? up=/, down=\, unison=-. e.g. //\-/ or uudsu
Refined Contour	<input type="text"/>	? up step=u, up leap=U, down step=d, down leap=D, same=s. e.g. uUDsdu
Location	<input checked="" type="radio"/> beginning of theme only, or <input type="radio"/> anywhere in theme	?
Key	Any <input type="text"/> Mode: Any <input type="text"/>	?
Meter	<input type="text"/> / <input type="text"/>	?

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architectural minimalism

- reduction of perceived complexity by externally visible distribution of responsibility
 - interaction of specific, functionally minimal tools
- Obendorf's examples
 - 1958 Lego brick
 - Apple Automator
- music research example
 - COULD BE graphical interface to music21 or Humdrum



compositional minimalism

- reduction of aspects decreasing the tool's usefulness for other tasks through *specificity for planned tasks*
 - allow appropriation, 'misuse'
 - make unfinished nature transparent
 - importance of interoperability
- Obendorf's examples
 - Post-It Note
 - E-mail
 - Wiki



compositional minimalism: Verovio



lends itself well to appropriation, see e.g. <https://raffazizzi.github.io/meteomozart/>



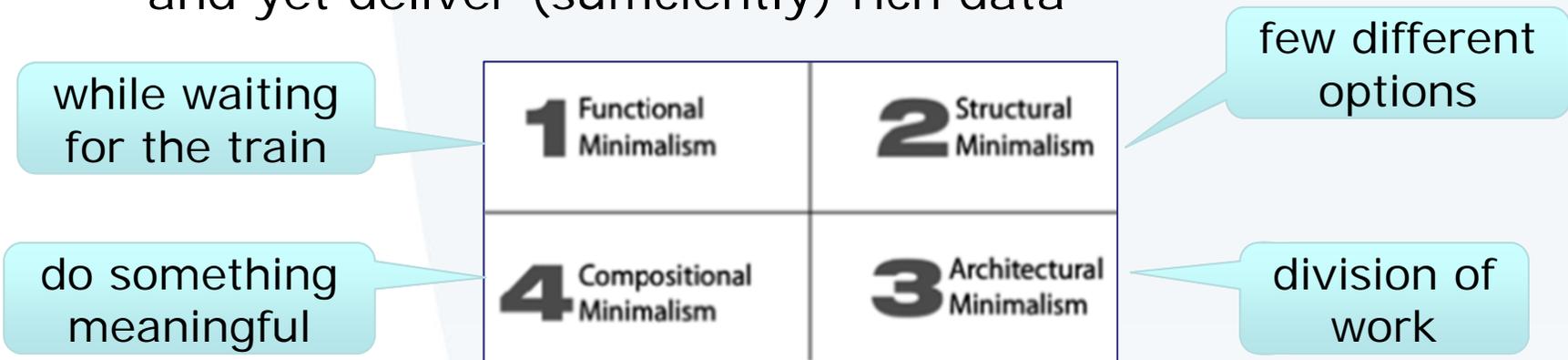
Applying minimalism

- Obendorf treats minimalism in *interface design*
- there are important consequences for software design
 - architectural minimalism → interoperability
 - compositional minimalism → removing constraints
- persona/scenario based design methodologies are recommended
- such approaches seem to me particularly important when we wish to reach out to other communities, e.g. musicologists and citizen scientists
- and especially if we want to *create critical mass*



A scenario to work on

- large-scale data creation
 - human intervention is likely to remain crucial for the foreseeable future, e.g. for OMR correction
 - make this simple
 - make this rewarding
 - and yet deliver (sufficiently) rich data



- can we envision a solution during this workshop?





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(preliminary) conclusions

- digital editing of music
 - great progress
 - not yet a well-defined 'genre'
 - within-community focus
- minimalism may help to
 - focus on the human side of systems design
 - counterbalance complexity
 - make software development easier
 - create user empowerment
 - maybe reach new audiences

