



Notes of DAISY Music Braille Project Meeting 28 and 29 May 2019 WIPO, Geneva

Issued: 25 June 2019

Chaired by: Arne Kyrkjebø (Project Owner) and Sarah Morley Wilkins (Project Manager, and notes).

Project documents: All reports and project documentation, including notes and presentations from this and previous meetings can be found at

www.daisy.org/project/daisy-music-braille

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Attachments in ZIP file

The meeting zip file contains the following documents.

Meeting Notes:

- Notes Geneva 28-29 May 2019 DAISY Music Braille (DOC and PDF)

Presentation Files:

1. Arne & Sarah's Presentations 28-29.5.19 (PPT)
3. Italian Library for the Blind BMML presentation 28.5.19 (PPT)
4. Dedicon Presentation 28.5.19 (PDF and PPT)
5. SBS Presentation 28.5.19 (PDF and PPT)
6. Dancing Dots GoodFeel Presentation 29.5.19 (PPT)
8. DZB Hodder Presentation 29.5.19 (PPT)

Developer Responses to the Requirements:

6. GoodFeel Requirements Response 29 May v2 (DOC)
8. Hodder Requirements Response 27 May v2 (DOC)

Executive Summary

This summary shares the main issues addressed in the meeting. The project's main aim is to support the development of a sustainable tool (or tools) to convert MusicXML files into embossable music braille, and this 1½-day meeting focussed on our prioritized Requirements and responses from developers, and agreeing our next steps.

The rest of this document gives a very detailed record of the presentations and discussions to allow those not present to be as informed as possible.

The presentation files are all available alongside these notes for completeness.

1. There was a good mix of meeting participants, including commercial and non-commercial agencies, producers of music braille, and developers of the tools, many of whom were also end-users, and the chairs felt that the work since October and presentations and discussions here have moved us forward a great deal.
2. The prioritized Requirements were considered to be broadly indicative of the sector's needs. They were intentionally focussed on what's required from a production tool (to convert music into braille), not on what's required from an interactive user tool (for learning music in an accessible way).
3. It was agreed that we should try to secure at least two tools, to serve the specific needs of producers, and of end-users, and to minimise risk of reliance on a single tool. We agreed that further work is needed to collect specific Requirements for an interactive user tool, as well as to further define a few existing Requirements.
4. Country layouts/formats and differences make it difficult for developers to code to our Requirements in a cost-effective way and permit easy file-sharing. Whilst NIM and MBC documentation is still relevant for actual braille codes, the UK (through ICEB, the International Council on English Braille) is compiling a list of gaps which need addressing.
5. Bar-Over-Bar (e.g. as used in North America and the UK) is very different from Section-By-Section (e.g. as used in Germany), and we agreed that the tools must be able to produce both so that users have the choice, and that materials can easily be created for other markets. This is radical development for existing tools which each currently produces only one of these formats and will need input from braille layout experts.
6. Dedicon has had good results with DZB's Capella-Hodder workflow for scanning, fixing and converting good quality print sheet music. Dedicon (and DZB) prefer to use printed music as their source rather than risk poor quality MusicXML files found on the internet; alternatively Dedicon occasionally uses Braille Music Editor to enter scores manually. Dedicon now offers a commercial music braille conversion service for other agencies for any kind of score, which was welcomed.
7. SBS proposed that alongside tool development a 'global virtual competence centre' could be set up to keep music braille expertise alive, and to share expertise across

agencies worldwide. This was felt to be potentially beneficial for countries without expertise, to meet periods of high-demand, or for specialist material. We will circulate a call for interested parties to develop the idea. This is timely as many agencies are now planning for their future music braille expertise.

8. The first developer presentation – BMML from the Italian Library for the Blind, Giulio Benincasa and Gianluca Casalino - described how they would like to finish development of their Braille Music Mark-Up Language (BMML), based on XML. Through their presentation and discussion, they proposed that developing a comprehensive semantic language for music would permit easier conversions and interactive exploration of music (when learning with speech, sound, braille, print etc). Agencies could create hard-copies from this format, and/or distribute the master BMML file to end-users to explore as they wished. Their tools, Braille Music Reader and Braille Music Editor both need developments too, especially for MusicXML import and some accessibility features, and these improvements are needed regardless of the BMML code development. Questions arose as to whether the existing internal working files of Hodder/GoodFeel could be a BMML-equivalent, and how to convert between BMML and MusicXML formats.
9. The second developer presentation – GoodFeel from Dancing Dots, Bill McCann and Albert Milani – outlined where GoodFeel already meets the Requirements, and the main areas of improvements which would be needed. GoodFeel (with Lime) is mainly aimed at the education market for converting materials and for exploring scores in multi-media interactive ways, but is also used by professional musicians and transcribers. Lime can import various file types as well as direct input and pass to GoodFeel which produces Bar-over-Bar materials. Adding Section-by-Section formatting to meet the needs of other countries is one of the biggest additions they would have to make, in addition to other improvements. Bill requested greater international harmonisation and documentation of formatting and country codes to make coding more efficient and the converter simpler to use, and to improve file-sharing opportunities. They estimated around 2,800 hours of development work over two years to deliver what they had itemized in their response document, and were open to a negotiable hourly rate. Discussion included ways to further translate the tool, documentation and learning resources; how best to implement country variations in a reasonable way; and using their API to connect GoodFeel to other braille production tools.
10. The third developer presentation – Hodder from DZB, Matthias Leopold – described where Hodder already meets the Requirements, and the main areas for development which would be required. The online Hodder tool (with Capella) is mainly aimed at agency production, but a free online service is also available for end-users. It can produce braille, large print, print, and sound files from imported Capella and MusicXML files. It produces Section-by-Section materials which is favoured in Germany, and produces almost perfect conversions from Capella files, which may not even need proofreading. Through the presentation and discussion, Matthias reported how he could implement Bar-Over-Bar formatting to meet other countries' requirements, but he would like input from braille notation and formatting experts, as well as feedback on the recently-implemented MusicXML import tool to reduce import errors, and a bug-tracker. Adding HTML (and BMML) output could allow navigation through the score. A new release of Capella Scan is expected at the end of the year which should improve accuracy

of scanned lyrics and therefore conversion into braille. DZB proposed they could free up Matthias 75% of his time for the required development, but did not propose a cost at this stage, and if others can provide feedback and documentation more coding can be done.

11. In the final session, Arne recapped the project drivers - to support the development of at least two sustainable tools for the conversion of MusicXML files into braille, primarily for agencies but also trying to support the needs of end-users. He and Sarah described various options for progressing and funding the project, and proposed a collective fundraising model with financial and in-kind support from various stakeholders, a steering group/project board, a project manager and a group of worldwide testers, an Agile technical development approach with a phased delivery plan according to raised funds, with DAISY issuing contracts and managing the finances. NLB has funded all the work so far, and has just secured €30,000 from the Norwegian Association of the Blind, though this won't be enough to fully support the development.
 12. The discussion supported this proposal, and examples were given of how DAISY has delivered similar projects. We also discussed ways to share music braille files through e.g. Bookshare, and whether we could store the MusicXML master files together with their braille (and other) files in the repository. Work to improve MusicXML and to influence the new MNX standards, as well as Engraving guidelines should help to improve the quality of the original file through all converters. The W3C is looking into the use of Scalable Vector Graphics (SVG) to display other visually complex and symbolic information in accessible ways (e.g. Chemistry) and this could also be relevant to music; indeed, Dancing Dots built a prototype of something similar on a touch pad a while ago. We discussed what information agencies would need and when, to try to secure future funding.
 13. Actions agreed:
 - a) **Sarah & Arne:** Send out a call for Steering Group participants.
 - b) **Sarah & Arne:** Prepare a project plan (with estimated costs) to circulate to agencies and funders in late summer-Autumn.
 - c) **Everyone:** Consider how you could contribute phased funding commitments and in-kind contributions to sustain activity over the coming years.
 - d) **Sarah & Haipeng:** Start gathering specific requirements for an interactive user tool.
 - e) **Roger:** Identify gaps which need addressing in notation and layout/formats.
 - f) **Everyone:** Give feedback to DZB on their MusicXML import tool.
 - g) **Everyone:** Respond to survey from SBS about a 'global virtual competence centre'.
 - h) **Antonio:** Specify notations in Braille Music Reader and Braille Music Editor which are working/not working to enable developers to try to output in BMML format.
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Participants

Tuesday 28 May

Sarah Morley Wilkins (DAISY, UK)
Arne Kyrkjebø (NLB, Norway)
Antonio Quatraro (Italian Library for the Blind, Italy)
Gianluca Casalino (Italian Library for the Blind, Italy)
Giulio Benincasa (Italian Library for the Blind, Italy)
Roger Firman (UKAAF/ICEB, UK)
Lia Cariboni (SBS, Switzerland)
Manfred Muchenberger (SBS, Switzerland)
Stephan Handels (Dedicon, The Netherlands)
David Clarke (RNIB, UK)
Matthias Leopold (DZB, Germany)
Haipeng Hu (BrailleOrch and DAISY, China)
Bill McCann (Dancing Dots, USA)
Albert Milani (Dancing Dots, USA)
George Kerscher (DAISY/Benetech, USA)
Jostein Austvik Jacobsen (NLB, Norway)
Rita Chung (Hong Kong Society for the Blind, China)
Shinko and Yuka Nagashima (Helen Braille Music Library, Japan)

Wednesday 29 May

Sarah Morley Wilkins (DAISY, UK)
Arne Kyrkjebø (NLB, Norway)
David Clarke (RNIB, UK)
Antonio Quatraro (Italian Library for the Blind, Italy)
Francisco Javier Martínez Calvo (ONCE, Spain)
Roger Firman (UKAAF/ICEB, UK)
Lia Cariboni (SBS, Switzerland)
Manfred Muchenberger (SBS, Switzerland)
Stephan Handels (Dedicon, The Netherlands)
Susanne Dyna Knudsen (NOTA, Denmark)
Rita Chung (Hong Kong Society for the Blind, China)
Lynda Chung (Hong Kong Society for the Blind, China)
Gianluca Casalino (Italian Library for the Blind, Italy)
Giulio Benincasa (Italian Library for the Blind, Italy)
Hannes Kaden (DZB, Germany)
Thomas Kahlisch (DZB, Germany)
Matthias Leopold (DZB, Germany)
Haipeng Hu (BrailleOrch and DAISY, China)
Jostein Austvik Jacobsen (NLB, Norway)
Albert Milani (Dancing Dots, USA)
Bill McCann (Dancing Dots, USA)
George Kerscher (DAISY/Benetech, USA)
Avneesh Singh (DAISY, India)

Day 1 - Tuesday 28 May - 14.00-17.00

1. Welcome and Progress Review (14.00-14.30)

Arne Kyrkjebø (NLB) and Sarah Morley Wilkins (DAISY)

Refer to file: 1. Arne & Sarah's Presentations 28-29.5.19 (PPT).

Arne (on the right in the photo) welcomed the representative mix of participants to the meeting, including commercial and non-profit manufacturers, users, and organisations producing content. After our previous meetings and surveys which were information-gathering and sharing, these two days will enable us to be more concrete for our future plans.



With presentations from developers and a proposal for how the development project might work, we will be looking for contributions of finance and effort. NLB has financed the project so far, but if we want to support technical development additional funding will be required (see slides 1-3 of Arne and Sarah's presentation).

Sarah (on the left in the photo) presented slides 4 to 8 of Arne and Sarah's presentation, reminding us of our current focus on two issues (getting good input files, and improving conversion tools), and gave an overview of the good progress on those two areas made right across the project since London (refer to the update papers previously circulated).

Key achievements are:

- a prioritised Requirements document;
- requirements submitted to W3C for MusicXML 3.2 and MNX developments,
- the UK trials of conversion tools leading to immediate bug fixes and improvements in some tools;
- guidelines for Sibelius engravers;
- a plan for an engraving trial in India to engrave scores to our specification to generate more complete MusicXML output which should mean the tools can convert files more effectively;
- a proposal for the process for collective agreement and financial contributions.

Sarah also noted that DAISY is not responsible for documenting or developing braille codes or layouts (presentation formats) for music braille, but is trying to liaise with relevant agencies who may want to address it in a way which benefits the music braille sector.

Questions/Discussion

1a) Wording clarifications in the update for DAISY Board paper

Roger: In the Update for the DAISY board, a couple of wording clarifications sought.

Sarah:

- Item 5, ambiguous wording. It should read that our requirements will inform the future MNX code, as that hasn't yet been developed, as well as improvements to the next version of MusicXML 3.2.
 - Item 10, typo. It should have been 'World Braille Council' and 'World Blind Union', not World Braille Union.
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2. Prioritised Functionality Requirements (14.30-15.15)

Sarah Morley Wilkins (DAISY)

Refer to file: 1. Arne & Sarah's Presentations 28-29.5.19 (PPT).

Sarah presented slides 9-18 of Sarah and Arne's presentation, describing the process for, and findings of our requirements gathering, rating and prioritization, to support the development of a sustainable tool (or tools) to convert MusicXML files into embossable music braille.

The primary aim is to support agencies producing music braille, but wider views were sought and obtained in the survey. With 34 responses from 15 countries and 20 organisations Sarah felt that the prioritized requirements are probably indicative of the sector.

She suggested that our focus should be on:

- Basic coding accuracy for the most common score types
- Essential and Essential-Desirable features
- Features for a conversion tool (not a score editor)
- Features to make the tool fit for the future.

She also proposed that a single tool is likely to be impossible to suit all user needs (e.g. user/education and professional transcription agencies), and hoped that developers would position their products to specific user groups/markets.

Sarah thanked everyone who had responded to the survey so thoughtfully, and the developers who had responded so quickly and carefully to such a complex Requirements document and being able to present their responses at this meeting.

Questions/Discussion

2a) Who's setting the music braille coding/layout? Is there a global body/standard?

Bill: Developers need to know who's setting the music braille coding/layout standards – are there competing standards (e.g. ICEB, World Braille Council)? Is there one global authority?

Roger: The New International Manual NIM (Bettye Krolick 1996) is still the official world standard. However, Music Braille Code 2015 MBC produced by (BANA) Braille Authority of North America, is used by some countries. The UK through ICEB (International Council on English Braille) is compiling a list of gaps which need addressing.

Sarah: Perhaps our collective response could find pragmatic solutions to developers on a case-by-case basis in the short term?

Antonio: in 2004 I worked with Bettye Krolick, I was elected as VP of ICEB. Braille and Music Braille are real languages. Like every spoken language it develops and evolves over time, so we will never be sure we have a 'final' answer for every situation. I appreciate the real legacy of the Requirements work we've conducted. Braille is less and less used, but indispensable for many people. We should consider the core DAISY format – we have developed a new format to describe music with voice, sound, magnified print, braille, and audio, as part of the wider MusicXML language. This would be the building blocks of future solutions, integrating with mainstream. I believe we need a clear awareness of the need for a format which describes music in braille, to be effective, comprehensive and shared.

Matthias: I understood from Roger that there are two ways to present braille, one is optically, to show the print layout, and the second is content-based, showing the pure music. Both ways are clear and maybe both necessary, but a single coding doesn't do everything. We don't want more dialects, but perhaps there are two.

Bill: All good points – but which global standard are we supposed to code to? Is there one? How can we get one? Need to make it easy as possible to know what music braille should look like before we share it so we can share scores easily.

Antonio: the Krolick manual is still mostly OK (apart from some national accepted traditions), though there are some gaps e.g. modern music, so at some point these will be updated and refined. Developers should still refer to the Krolick manual.

2b) Would cascading style sheets be useful when producing music braille, e.g. to convert between Section-By-Section and Bar-Over-Bar formats?

George: are CSS used to control the presentation of the music braille, like we use for HTML, to control how specific elements look? This could control how country styles/authorities are applied.

Matthias: No, it's too complex to use style sheets. The two major presentation layouts are Section-by-Section and Bar-Over-Bar – very different from each other, and enforce very different notations. The other layouts are sub-sets of these. Both notations have advantages and strengths, but can be very hard for users to read the other format.

Antonio: Krolick manual says we accept both layouts: Bar-Over-Bar e.g. for novices, and Section-by-Section for advanced users. The Italian BMML would be capable of producing either format easily, and show/hide classes of signs, to suit beginner/advanced users. We should put together a single format which includes the greatest number of symbols from classical music.

Gianluca: We can do more with BMML than MusicXML; it can remember the final decision of coding. Style sheets could be efficient way of sharing layouts, just like Finale/Sibelius can do different layouts for different publishers).

Sarah: Referring back to my Observations slide (17) – I suggest we should concentrate on the most common score types; let's sort out presentation and coding for those urgently. Also, let's focus on a conversion tool rather than an editor. And focus on making a tool(s) fit for the future. It's probably not possible to make a tool which can meet all needs (users, teachers, professional agencies), so I suggest developers focus on a particular group.

Matthias: People tend to read either Section-By-Section or Bar-Over-Bar; they don't swap between them. Some presentations are entirely different between these layouts, so cannot convert between them/paper width. The content also has to change if the format changes – only the software can calculate this, it can't be stored in the file format.

Roger: Matthias put that well, both systems are valid. And the Bettye Krolick manual deliberately did not address formatting issues – that still needs doing.

Bill: Remember: the more formats you have, the more work you have.

Sarah: We discussed in London how compromise might be required for layout/formatting, to make the tools as simple and effective as possible, and teach users how to read scores in the interest of keeping software viable and the sector afloat. We need to keep compromise in mind.

Lia: Hodder does Section-By-Section really well; so if you want to change the format we could just have an option to change how the repeats are presented, then you could convert to Bar-Over-Bar.

Matthias: I have an idea to solve this problem (e.g. only allow doublings within measures, not between measures; and if repeats are used, they are always limited to all measures at the same time) – then we can reformat it, but may still get repeats at the start of the line. But, with some compromises like this it could be possible to convert Section-By-Section to Bar-Over-Bar format and for it to be readable.

3. Developer Response #1: BMML (15.30-16.30)

Gianluca Casalino and Giulio Benincasa (Italian Library for the Blind)

Refer to file: 3. Italian Library for the Blind BMML presentation 28.5.19 (PPT).

Giulio (on the left of the photo) and Gianluca (centre) presented, with additional remarks from Antonio Quatraro (on the right). They explained how their proposed braille music format, BMML (which could be viewed as a sub-set of XML), could meet around 80% of our Essential Requirements, giving flexible and multi-sensory ways of reading and writing music braille.



They proposed that we should be solving the problem through creating ‘accessible music’ with multiple outputs, not just ‘braille music’ which is just one output format required by blind musicians - and that solution is through a structured music format rather than a new conversion tool which allows navigation, editing, and exploration in sound, speech, braille and print. Their tool Braille Music Reader can navigate through scores in this format. BMML does not store layout or preferences for layout, just the information in the score. But you can transform the layout in other tools. BMML is ready to convert the major symbols defined in the manuals.

They shared the areas of work which would be necessary to make BMML the powerful tool they strongly believe it could be which could meet the sector’s needs to create accessible multimedia music, the Requirements document and the opportunity to share files. It needs updating to meet NIM and MBC standards, and offer greater personalisation options, depending on the type of user, and to support MusicXML 3 and MNX. We have to decide who the main users will be – transcribers or end-users, they have different needs, should have two tools – a professional tool, and a user-tool. They reported that their target market would most likely be for individual use by blind musicians, including those learning music, when the music braille format must be very easy to use.

They have a big agenda for BMML development and reported that they could not yet estimate costs required, but this would be possible once further issues are defined and tasks are agreed and we can start working together.

Questions/Discussion

3a) How can your tool meet the requirements for automated production?

Arne: You describe how your tool is aimed at end-users; if we at NLB want a production workflow with automated production, what are the gaps in your tool which would allow it to support the production flow requirements?

Gianluca: The great opportunity for any user would be to have digital scores (from e.g. NLB) which they can read in different ways, e.g. when studying a score then later when performing, having options for e.g. clef marks, dynamics, fingering etc.

Antonio: Our format associates each single sign with a sound, so if you don't understand the sign you can hear it, spoken music describing it, as well as reading the braille, to encourage braille literacy. Other musicians learn by ear, or through dictation. The user can produce materials for sighted people too - our Braille Music Editor uses BMML format, which can navigate, listen, explore, and output multiple versions from a single source file, e.g. braille, midi. But they couldn't finish it within the 3-year European project, it's about 75% there, looking for sponsorship to help finish it – it's free open to everyone, and they'd like to implement it in Linux and other platforms. The library can produce these files in BMML for the user.

Antonio: It can create both simple and complex scores from a single source, and the user can choose to view more features later, so they can listen and navigate through the file e.g. just to the notes, or more details.

Gianluca: For example, just as with a DAISY file you can do a lot of operations from one file, can read, listen, print and explore. We could call BMML the DAISY Music Format, can read, navigate, listen and print in different ways.

George: But you can still produce traditional embossed braille from the BMML file?

Antonio: Yes, you choose the format you want from the single source (e.g. Bar Over Bar, or Single part), and can listen to it, and hear it, you can listen while you are reading. Ask us for our video demonstration.

3b) Could it work with new multi-line braille displays?

George: What do you think about the new multi-line braille displays?

Antonio: Using each country's braille table(s) we can customise the output for any braille device.

3c) What platforms could it run on?

George: There are hardly any Linux users nowadays, so Android and iPhone would be the ones you would like to support?

Antonio: Yes. EU research money funds prototypes, but Gianluca found Music21 at MIT; could make it easier to make the Braille Music Editor more cost-effectively. We appeal to everyone to join efforts to solve this.

3d) How do we get from MusicXML to BMML, and vice-versa?

Lia: BMML is wonderful and we're very happy that you can read, listen etc. But, how can we get from MusicXML to BMML, and vice-versa? We'd need that to use as a production tool, and users too might need that.

Antonio: We have a module which imports MusicXML2, though this is out of date and not very refined, and later versions are not supported. If you use Braille Music Editor then you can export a good MusicXML version. But importing is not as good. If we can find people/institutions to join us, we give our work for free, we're just over half-way through after the EU funding. Would like to work out how much it would cost to finish a good flexible tool.

3e) Why I think BMML is the ultimate solution to our requirements

Haipeng: I'm a transcriber myself, and I would prefer BMML as a semantic language, but it does need to be completed, and it needs support for MusicXML to BMML transcription, and development to the BMML format itself. I know about BMML itself and Braille Music Editor, and if these were well-developed these would fulfil almost all the requirements from various transcribers – because it's a semantic language which can be adjusted flexibly. So, we can use pre-sets and options to ease the production process. The current Requirements are mainly about transcription tools, rather than e.g. hiding symbols and listening to a score. But if BMML was well-developed it would support both transcription and user requirements - it has variability and extendability – and we should rely on such a language to represent braille music, rather than concentrating on music notation software, MusicXML and plain braille code. The development of BMML will take more time and resources but in my opinion, it would tackle the root problem, whereas fixing conversion tools only solves problems at the surface. BMML and BME are the best solution for all kinds of requirements – e.g. doing the different formatting options already discussed.

3f) Improvements needed in Braille Music Editor

Matthias: Braille Music Editor could be a perfect tool, developed over 12/14 years by several people, and cost a lot of money. We should be careful to distinguish between the tool Braille Music Editor, and the BMML format. If the problems in Braille Music Editor could be fixed (e.g. it needs a stable MusicXML import, and the accessibility problem in the description which makes a fundamental failure) – then this could be a lot of help for people. Perhaps you could fix those before considering anything else which would be a great help.

Antonio: Yes, the BMML format is separate from the tools we make, though they do use BMML format. Braille Music Reader is free, and totally 100% accessible. Braille Music Editor is commercial (not free) and it is also fully accessible – but what is not accessible is the program scanning the braille file and which transforms it into a structured document, because some situations in braille need the help of a sighted person.

Matthias: But both tools still have some mistakes as they cannot import MusicXML files. You will get a good tool if you fix the import and accessibility.

Antonio: Agree, this must be fixed, and yes, it's a problem with the software, not the format. We'd like a plug-in to be produced for mainstream music editors to create the BMML format so it stays up to date with those tools.

Matthias: Braille Music Reader and Editor tools both have some braille notations which are not supported. Do you have a full list of what is working/not working? Then we can create a tool to export as BMML which limits to what is compatible.

Antonio: Yes, we will try to make this list.

4. Update from Dedicon on their trial with Capella and Hodder, and announcement of new service for organisations worldwide (16.30-16.50)

Stephan Handels (Dedicon)

Refer to files: 4. Dedicon Presentation 28.5.19 (PDF and PPT).

Stephan reported their latest experiences of using Hodder at Dedicon, and their update (circulated prior to the meeting).

Their workflow comprises scanning of sheet music with Capella, which outputs a .capx file which is sent to DZB's online tool Hodder, and Hodder mails back the music braille file as .txt. Their experience shows that some editing is needed after scanning (despite OCR smart tools which find likely errors) as shown on screen-shots, but once that file is perfect Hodder returns a perfect file.



There is a learning curve with Capella tools, and if the original score is in poor condition it is quicker to enter it by hand rather than scan and edit. The pathway Capella-Hodder is mature and dedicated, and gets good and very fast results with complex materials as long as the source is good, and Capella is very flexible, with no possibility of adding human typos or braille mistakes. But disadvantages: for poor quality scores it's quicker to do by hand, the OCR can introduce some 'machine' mistakes, and you have to be sighted to use the GUI, and be familiar with the tools. Dedicon really like the Capella-Hodder workflow for sighted transcribers for optimal source material, using manual workflow as a backup (using Braille Music Editor).

Stephan also announced their new service for music braille transcription for all score types for any agency worldwide - for handwritten scores, standard sheet music and digital files.

Questions/Discussion

4a) How was the braille produced in your brochure?

Roger: In your brochure, is the braille example produced manually or with Hodder?

Stephan: Hodder (if it was the Billy Joel piece) – though I didn't make the brochure.

Roger: in the braille there's a metronome mark, but in the print there is not, you might like to check!

4b) Does the Capella-Hodder workflow use MusicXML?

George: Does it use MusicXML?

Stephan: No, it uses capx the proprietary format from Capella, but Capella can use MusicXML – though you get a lot of errors because of the variances in MusicXML. Getting dirty MusicXML files off the internet is a big problem.

4c) Is the Hodder format the answer to braille notation language?

Antonio: What is the output of Hodder, and how is the braille described? Once we have a good description of the braille we are on the horse. If the Hodder format is available, modifiable, free can we all use it?

Matthias: It's based on the Swiss XML format, which you know about, and which I have extended.

Antonio: Are we chasing something that's already in our hands - in Hodder? A good and exhaustive description of braille notation?

Discussion to be continued in Wednesday's Q&A Session.

5. SBS proposal for a global virtual competence centre (16.50-17.00)

Lia Cariboni (SBS)

Refer to files: 5. SBS Presentation 28.5.19 (PDF and PPT).

Lia shared her proposal on setting up a global virtual competence centre (previously shared in the updates) which would secure music braille production now and in the future through global collaboration to make use of scarce expertise. Even with better and partially automated tools, expertise is still needed in MusicXML formats, music production braille music production and proofreading.



The proposal would allow outsourcing to worldwide resources – a global pool of transcribers with different kinds of expertise and resources – and enable agencies to provide music braille resources to their patrons even if they do not have their own expertise or cannot meet all demand.

Lia raised several open questions to be answered by interested agencies – advantages, financing, pricing, coordination role - and wanted to know who might participate as a producer, customer or coordinator. SBS proposed to email round a short questionnaire to collect further info and proposals, and interested institutions – this work can be done alongside the development of the tools as the tools still need the improvements we've been discussing – but could be an immediate solution for agencies.

Questions/Discussion

5a) Are there any similar co-operations in DAISY history?

Arne: Is there any similar cooperation like this in the history of DAISY?

George: I monitor all the higher education emails in the USA, and we see questions all the time "I need this music braille in 3 days", especially at key times in the school semester, like the start of the school year – agencies have to put on extra staff at key times like Aug-Oct and Jan-March to meet these high peaks of demand.

5b) What is the motivation for organisations to participate?

Matthias: I really like the idea, but have two questions. Firstly, what motivation is there for organisations to keep/replace their own staff and expertise if such a collaboration exists? Secondly, does SBS plan to replace your own staff?

Lia: We are seriously thinking about the future, and don't know which skills they will need, so we are considering this kind of solution in case we can't find the right expertise.

Manfred: It will help if the tools are more automated, because then we will need more music know-how, and less braille know-how. But we agree, there has to be a motivation for organisations, they should be paid if they are providing resources for others.

Antonio: We are all in the same situation – sometimes we get lots of demand, other times none. It's very expensive to transcribe. We should issue a recommendation to the World Council of the Blind (*sic*) to sponsor this to provide the human rights of accessing music scores by blind people. If governments subsidise/pay for music education and the provision of music braille we can make big steps. We fully support the proposal to coordinate effort, and yes there are open questions, but we must ask for sponsorship from our national governments, EBU, WBC, ICEB etc. Music transcription is expensive, but equal opportunity is a right, and music is the only form of art which is fully accessible by blind people.

Manfred: Is anyone else interested? [show of hands]. Yes - some, and we need to ask others too.

David: My concern is that you wouldn't want to detract from the efforts of the automated tool developments – you could put a back-stop in place funded by governments, but this might be unsustainable in the long-term. We would seek to cooperate, but the longer term objective is to have something that's automated and sustainable, which helps people to pursue their careers and their love of music in the way they choose.

Sarah: So, if it helps retain expertise in institutions and meet demand at peak times of year this might help everybody.

David: our view as RNIB is that we're running out of this talent, and seems to be true in other countries too.

Discussion to be continued in Wednesday's Q&A Session.

Bill: offered to do demos of GoodFeel latest software.

Day 2 – Wednesday 29 May - 09.00-15.00

6. Developer Response #2: GOODFEEL (09.00-10.00)

Bill McCann and Albert Milani (Dancing Dots)

Refer to files:

6. Dancing Dots GoodFeel Presentation 29.5.19 (PPT).

6. GoodFeel Requirements Response 29 May v2 (DOC).

Bill (on the left of the photo) presented, supported by Albert (on the right). GoodFeel enables blind and low vision musicians to independently read, write and record their music using their preferred mix of braille music, verbal and musical cues. Bill described the strengths of the tool, and that they mostly serve the education sector (students and sighted teachers), some professional and amateur musicians, and some professional transcribers.



Bill described how GoodFeel meets many of the features in each Requirements area, and identified areas in-scope for future improvement.

GoodFeel can import several file types, via Lime, as well as direct input, and has a variety of features for customizing the output. GoodFeel produces Bar-Over-Bar layout to suit the North American and UK audiences. Adding Section-By-Section layout, and improving chord symbols and figured bass to published standards, are all big jobs, but can be done, and other improvements throughout the tool would fix bugs as well as add functionality to meet the requirements. Bill called for international cooperation to reduce international country code variations to streamline production and file sharing. Bill proposed a workplan against the Requirements (as detailed in their Requirements Response document), estimating the need for overall approximately 2,800 hours of work over 2 calendar years, with a negotiable hourly rate.

Questions/discussion

6a) What would your development rates be, and what are the 12 categories you describe?

Roger: What kind of rate did you have in mind? Also, what are the 12 Categories you talked about in your response and time estimation?

Bill: Something comparable for developer rates, support costs etc. The funders can now specify which features in the Requirements document they really want to fund now that we've estimated time to build each feature. The first 11 categories are the 11 in Sarah's Requirements Survey/Report (e.g. 1 Accessibility and Usability etc), and the additional category we've considered is 'Oversight and Administrative' for doing the project.

6b) What learning resources are available and in which languages?

Matthias: Do you have lessons for teachers on how to teach music and music notation with GoodFeel? Translations of resources would be valuable in other languages to broaden your reach to other countries.

Bill: We do want to make more tutorial and video content like this. We publish a series of courses: 'An Introduction to Music for the Blind Student' which teachers work through, and we have user manuals; we do phone-based/Skype-based braille music teaching to blind students under school contracts. Translations would be wonderful, yes. We also developed 'Music Touch' for teaching music braille which uses a touch-pad which plays and speaks the notes) – but we need further funding to complete this.

6c) Can GoodFeel connect to other braille production tools?

Arne: Can GoodFeel connect to other braille production tools in a workflow as well as to Duxbury, for producing textbooks containing music? We use a different braille transcription tool in the Nordic countries.

Bill: Yes it would be possible. Albert created a DLL version of GoodFeel without an interface, where the tools can request/send information to each other, allowing the braille tool to handle it all. This could be expanded, and Poland have just integrated it with their braille production tool.

6d) Can we try a demo version?

Antonio: Is there a demo version?

Bill: yes, we have an evaluation version, you can email Bill to request a copy and receive a private link and guidance to set it up: info@dancingdots.com

6e) Is your format open, so we can we easily apply country requirements?

Antonio: Is the braille music format you've created open for modification to take account of country requirements, or is it closed? For example, does it have a layer where we could easily apply the Italian or French way of formatting?

Bill: We produce either BANA or UKAAF format (for US or UK formats respectively), and some features which are commonly liked in Europe. If you know braille you might be able to make some global changes, though it's not recommended. I suggest you go back to change the Lime file, launch GoodFeel again, and make a new file.

6f) Can the interface be translated?

Antonio: Can the whole tool interface be translated into another language, e.g. Italian?

Bill: Yes, we have phrase files so we can localise to other countries, and are looking for more partners. Already have partners for Spanish, French and German.

6g) Bar-Over-Bar vs Section-by-Section – do we need both?

Sarah: A question for the room – since GoodFeel cannot currently do Section-By-Section (but it could do), do you think it's worth the development effort, or could users get used to it with training and support?

Matthias: I've done some tests with German music braille readers: Section-By-Section is so much easier to read especially in the beginning. Also German braille users don't want to use Bar-Over-Bar, it's so totally different – and DZB believes that users should be given the format they find easiest to use. German users would rather transcribe it again rather than use a format they can't read.

Thomas: Most European users have got used to Section-By-Section, and whilst they could get used to another format, we should be flexible and offer both formats for existing and wider users.

Bill: I agree, we need to provide flexibility and have tools which can do both. BRF files are inflexible, and I had the same idea as Antonio – we could produce DAISY-type braille, if Lime/GoodFeel could export to a DAISY format, then a DAISY player could reformat e.g. Bar-Over-Bar or Section-By-Section, to present according to user wishes, but perhaps we can agree some presentation issues to increase consistency and file-sharing. Bettie Krolick's manual deliberately avoided formats and country codes (good for keeping the peace!), but makes it hard to be flexible and to share files; every option we add costs time/complexity.

Antonio – Bar-Over-Bar is a good solution for beginners and simple music. But for long staves or more expert readers, Section-By-Section, or Single Line as used in Italy, respects the format of the original text – especially necessary if the teacher is blind. To be flexible we should think of a comprehensive braille format to enable us to reorganise the whole score by any format, and to hide/show some classes of signs for different levels of user. We need to invest time and resources for a comprehensive format – to build good foundations for a big building. Otherwise we're building something which may not last long without solid foundations.

Lia: At SBS we use Hodder, but we want different output to that used in Germany. Could we have a pre-step so we can work on the intermediate file so we can adjust the format? Sometimes we do want a totally automated process, but sometimes this pre-step would be helpful. Is that possible? [no answer].

6h) What code harmonization could simplify the tool?

Sarah: Country code harmonization – is this even possible? What compromises could be acceptable? We're not The United Nations or Braille Authorities, but Bill asked if we could agree some country codes in the interests of file sharing and efficient tool development – does GoodFeel have a proposal for what they should be?

Bill: No, we would need to consult, it's a political job, would need negotiating and compromise, unless we can propose and agree a DAISY-code. When we were young and studying, we were happy to get anything instead of nothing, so we would accept differences. If they can get something and get it quickly – there's a lot to be said for that.

Antonio: Yes, when we were young we received specially-created, detailed and correct music scores, but these are not being created now, the world has changed. But we have new opportunities with technologies – if we can give them a simple score they can learn to read music braille, and if they can click and hear it themselves they can learn themselves.

Bill: Our presentation includes reference to 'beginner braille' feature, so you can selectively hide/show features for different levels of users as they're learning music braille.

Manfred: Maybe we could compromise – and accept some limitations of transformations between layouts; just to facilitate the ability to convert from one format to another.

Bill: Yes we have to reduce the number of ways we can present it, or make every option available which takes time and money. The clock is ticking – kids need to learn it, and talking scores etc are all wonderful, but need to be sure to secure vital music braille for the future.

7. Project activities Q&A (10.00-10.30)

Sarah introduced this session for discussion or questions on papers/updates circulated with agenda, especially for Dedicon and SBS after their presentations yesterday.

(No presentation files accompany this section, but you can refer to the update papers circulated with the agenda).

7a) Thanks to BrailleMuse

Roger: I'd like to pay great respect and record our thanks to BrailleMuse software colleagues who aren't with us here, but who have done some really good work during the testing process. We look forward to onward discussions with them, and bug fixing is probably their priority right now - although they have implemented some things we reported in our testing even though initially they said they were out of scope. I'd recommend trying the tool out again now these fixes (and some major advances) are in place. They don't issue feature update logs, but my testing report includes reference to what's been updated, and I will update people individually if necessary.

Sarah: Agreed, their tool is useful and is in use. They have been included in all invitations and documentation and support was offered, but sadly, they said they were unable to consider this kind of major development project at this time. We have been encouraged by their positive response to making fixes and are grateful for their efforts, it's good to have options available for music braille tools to suit different user needs.

Antonio/Gianluca: we promote BrailleMuse on our website, and are also in touch with the developer.

7b) Did the UK trial conclude which tool created the best output from the same file?

Lia: The UK trial was very good, though I didn't see any conclusions about how the different tools compared when converting the same output.

Roger: We didn't set out to test that – to keep it manageable we tested small chunks of data with each tool where we'd found specific problems in specific tools. Anyone else could make the same tests with the files with other tools – and you may get different results using other combinations of tools.

Sarah: The UK trials were trying to improve individual tools where bugs had been identified, giving them examples of problems; rather than trying to compare tools.

Roger: The individual tool bug list were sent to developers, and they responded with some fixes and updates.

Matthias: A comment on the testing process - Hodder is always looking at the whole piece and making decisions in context, so it was sometimes hard to do properly with short artificial test files where the wider context is missing. But this feedback was given to Roger for their report, and some things were updated where possible. Sometimes the MusicXML importer

(an external tool) causes the problems, rather than Hodder, so we need to establish where the errors are originating, and feedback is sought on the import tool.

Gianluca: Our experience with BrailleMuse: it depends on how BrailleMuse imports MusicXML, and how the software originally saved the MusicXML. We have different results – sometimes when we download a MusicXML file from MuseScore, then make a translation with BrailleMuse. But if we open the same file in Finale and translate without changes we get a better translation, because Finale is closer to the MusicXML specification. It's difficult to test the capability of BrailleMuse because you have to understand exactly how and where the MusicXML is provided.

7c) What does SBS need now regarding your proposal for a global virtual competence centre?

Arne: What do you need now, to follow up on your proposal; the next steps?

Manfred: We'd like to send (via Sarah) a very short questionnaire to the mailing list to ask who would be interested in playing a role. If there is positive feedback, SBS can discuss what we can provide too. It's not yet clear that SBS should do the coordination role – it's not a promise – we'd need to get an internal project agreed. Or if someone else wants to do that role, we don't mind – it's open.

Arne: Please also talk with Nota and ONCE.

7d) What workflow and formats is Dedicon using in your new transcription offering?

Arne: NLB is doing some test outsource production with Dedicon. Can you talk a little about how the music braille process works, production time, amounts, maybe prices, what can we expect if we contact Dedicon?

Stephan: it's a brand new service – all info on website. I'm the producer of the music braille (not on the marketing/business side). With good source materials I can work very fast, if it's poor I have to work by hand – reflected in the price – so we give an estimate for how many hours I expect to work on it. Then organisational overheads are added and price given to the customer. Regarding the quality of the score - as a sighted musician if I can read the score I can convert it into braille. If I get a perfect midi file and the customer wants just the midi information converted into braille then it's a very fast process.

Bill: Dancing Dots also offers a transcription service; we review the music and give you an estimate, with a per page rate/hourly rate. If you give us a MusicXML file, the charge is about one-third of the cost of a print score, because we don't have to scan or enter anything. We estimate on a case-by-case basis, producing as Bar-Over-Bar and Single-Line, piano or scores. Having the MusicXML import is helpful – but some files on the internet are horrible and aren't at all useful – when all the software tools complain about the file! We need to go back to publishers to tell them what we need, so the files are really good, and with good tools we'll get good conversions.

Stephan: At Dedicon we produce Section-by-Section for Dutch users. But Bar-Over-Bar needs more characters, and our printing street is optimised for Section-By-Section. We have some booklets of 33 characters for line, a handy format for Section-By-Section, but for Bar-Over-Bar it would become less readable. We may have to alter the format if we want to produce Bar-Over-Bar to use less paper to make it readable.

Bill: Bar-Over-Bar may take more pages, but when looked at on refreshable braille displays the per-page cost is irrelevant. People like what they know, they're comfortable with the format they like.

Antonio: How do you manage e.g. Chopin with 48 notes in a bar – how can this be done in Bar-Over-Bar when your line isn't that long?

Roger and Bill: it's perfectly possible, and has been done many times.

7e) How do Hodder and GoodFeel handle multi-part scores?

Gianluca: A question for Hodder and GoodFeel: in a two-part score, do you perform separate transcriptions in separate booklets, or one booklet with different lines for different instruments? Do you do it in the MusicXML file?

Bill: GoodFeel imports MusicXML with e.g. piano accompaniment and violin part - imports into Lime, which shows us piano LH, piano RH and violin. We tell Lime which parts we want for which instrumentalist, or can produce a three-line parallel score.

Matthias: Hodder can either separate by parts or by section, e.g. 1st section Violin and Piano; 2nd section Violin and Piano; or all Violin, then all Piano.

Bill: same for GoodFeel.

7f) Work on guidance for Publishers and MusicXML output files

Sarah: We were going to work with Bookshare and Bill to prepare a letter for Publishers to ask them to save their MusicXML files in a particular way. We've put that on hold while we do the engraving trial in India. If we test our new guidelines for Sibelius engravers there, and get better MusicXML files as a result, then we could then also ask Publishers' engravers also to follow our guidelines, which should give us better MusicXML files. We'll get quite quick feedback from our India trial – the guidelines are simple and should mean they apply Sibelius properly, which will export good 'braille transcription friendly' MusicXML scores (thanks to Haipeng for writing the guidance). The trial plan and the engravers' guidelines are in the pack of papers circulated prior to the meeting.

Haipeng: When working with different publisher files, I noticed that some notation software tools generated MusicXML exports, which gave very different results in different conversion tools. But, if perfect engraving methods are used we will get excellent MusicXML output which will get us good conversions. Most of the tips in the guidelines are actually existing points in the Sibelius reference manuals! The problems are usually caused by the customised practices of the individual engravers, not by the tools. So, if we train the engravers with correct customs then the MusicXML file exported will be braille transcription friendly.

Sarah: we'll share an update on the trials later in the year.

8. Developer Response #3: HODDER (11.00-12.00)

Matthias Leopold (DZB)

Refer to files:

8. DZB Hodder Presentation 29.5.19 (PPT)

8. Hodder Requirements Response 27 May v2 (DOC)

Matthias presented the DZB slides, and started by describing how Hodder converts Capella and MusicXML files to Braille. It can also produce large print and sound, and convert Braille to ink print and sound files, and supports MEI files [*Music Encoding Initiative?*]. Most failures are currently due to MusicXML import, rather than conversion failures, and the problem of differing notations between countries. DZB welcomes feedback, especially on the importer. Matthias recommended BME (Braille Music Editor) or GoodFeel if someone wants an interactive or editor tool, with sounds, and reformatting/filtering tool, e.g. especially for education.



The main users are German braille musicians (music on demand, or for free via online conversion), and SBS and Dedicon. It produces Section-By-Section format. Matthias described what options could be automated and grouped into profiles according to the context to reduce complexity for the user. Hodder is a conversion tool mainly aimed at educators, professional transcription agencies, and individual blind musicians. He described the fixes and extensions he would like to see in Hodder, with some questions for the sector. Initial work to produce Bar-Over-Bar for English-speaking countries needs more work – we could have a simplified Bar-Over-Bar, with some kind of further reformatting options. DZB would need feedback on notation requirements and can supply example files for decisions.

After taking some questions (see below), Matthias then highlighted areas of particular interest or for discussion from Hodder's Response to the Requirements Document, describing where Hodder meets many of the Requirements, with suggestions of how they could extend Hodder to support additional requirements (and he took questions throughout – grouped below).

Currently Hodder cannot support navigation through the score, but Matthias proposed outputting as HTML to enable this. Hodder cannot do Tablature. Other requirements need us to define our specification, e.g. some options and formatting, and volume handling.

DZB would like a bug-tracker system for people to report issues, and to share feedback during continuous improvements. For private use with digital files, the software is free, and for future use with agencies specific business arrangements would be put in place.

Questions/Discussion

8a) Is there a MusicXML viewer to proof/edit the score, so you know the file is correct?

George: Does Hodder have a MusicXML viewer, to see a graphical representation in a browser? How does a sighted transcriber proof the original file, and edit the MusicXML to correct something?

Matthias: No, you don't get good optical output for MusicXML, maybe it will be better with MNX. It's not easy to correct the MusicXML file. Better to correct the source before the MusicXML is exported. Or, you can import MusicXML into Capella and do editing and corrections there.

Antonio: It can be without errors, but can't be faithful to the original score. How can a sighted transcriber be sure the original text has been correctly transcribed?

Matthias: With experience! You get to know what will work well, and what is likely to be a problem. We've tried to make sure there are very few weak points.

8b) Do we need Hodder to provide HTML output?

Manfred: You asked if it would be helpful to have HTML output. Yes, probably – for braille displays. Or export to other production software e.g. DAISY Pipeline for example.

Matthias: We can do it (e.g. to meet the requirement of being able to access the scores), but we'll need a concept of how to use it so it's useful – please submit the description of how it would be used.

George: The output to HTML would have navigation, but the content would be pre-formatted braille?

Matthias: Yes

Bill: But what are the advantages of this? Why not just have a braille-formatted score someone could study.

Matthias: See requirements doc, 1.4 Essential 'to be able to navigate scores'. Having an HTML export could fulfil this function if you think it would be useful (if you read online you only have 1-line on a braille display).

Bill: If you use our tool Lime as your editor in Bar-Over-Bar you can see the braille music in a separate window, does this fulfil this requirement?

Matthias: yes, it's the same. It's not yet supported in Hodder, so I've tried to propose ways to do this.

8c) What are import errors, and how can they be fixed?

George: What's an import error?

Matthias: Hodder is fed a file either from Capella, or a MusicXML file through a small import programme, which is separate to Hodder, and this import programme is not yet well-tested – feedback would be appreciated. Most scores work well, but as an example of an 'import error': if you get a score with special articulation which is not currently supported, you have to assign a mapping at the import stage to specify what the symbol should be in braille. Hodder tells us that it is receiving something it doesn't know about (the 'import error'), and I can fix any problems with the import (it's not something which the transcriber can update themselves – they should tell me about any import errors they find so I can make a fix).

Antonio: Can it translate directly from MusicXML or have to go via Capella?

Matthias: Hodder can take directly from MusicXML via the Importer (and other codes too), as well as from Capella. Can also output to Ink Print and large print.

8d) How can you identify errors when proofreading the braille?

George: if you have a converter to print, a transcriber could look at the print and braille and see errors? How do you compare the braille with the print original?

Matthias: You can't really see braille errors by looking at the print. The braille notation errors are very much more specific than in print, so can't be seen in print. E.g. a list of chords with fingering, Hodder associates the fingering to the notes, but you can't see which finger is associated with which note apart from in braille. You should always proof the braille version. Could proof in different ways: with sighted pianist and brailist comparing; or blind proofreader reads the score (using a list of known mistakes); sighted person compares the notes with the braille on-screen. Different proofreading method depending on type of music. Most errors are from the source file or scanning mistakes, not from the conversion tool.

George: So, there's no need to proof the braille, it's always correct?

Matthias: For most needs, it's almost perfect. We do proofreading to ensure it's totally perfect, but 98/99% of it will be perfect. Some mistakes are with contractions, or from the original source.

George: So, if we improve the contraction errors on your side, the tool will be perfect?

Matthias: for a normal use the score will be perfect. Our Make Braille service is an online – you send us the digital score, we scan it (or send us a MusicXML file which we import), and convert it to braille, return the braille file with no proofing ready for embossing, we haven't ever had any negative feedback.

Bill: Errors in contracted braille are also found in GoodFeel – e.g. scanning tools don't do well with lyrics, so conversion might not be perfect. But there's no spell checker in the tools, so we can't know if the text is correct in the source. Teachers sometimes thinks the conversion tool is at fault, but it's actually the error in the original source which the teachers didn't spot.

Antonio: Do you do contracted braille?

Bill: GoodFeel can do either, but if there's a spelling error the braille will be wrong.

Matthias: Pleased to report that Capella Scan will release a new version at the end of the year which will improve lyric scanning, which will reduce this number of errors – after feedback we've given them.

8e) What programming language do you use?

George: What programming language do you use?

Matthias: Three languages: 1) Pearl – for a little bit - the braille to ink print; 2) Python – the bits on the server handling MusicXML files; 3) Prolog – for all the rest.

8f) What time will Matthias have available and what would the costs cover?

Bill: How much is your day/week can you devote to this work? How much is spent on this tool?

Matthias: My time is flexible, as I also have other responsibilities. Some weeks I dedicate a lot to Hodder, some weeks a little.

Hannes: We haven't yet worked out how much time we'd need to develop the Requirements. Matthias responded to the current situation in Hodder. In future – we can say that DZB can give Matthias' time to develop the Requirements – e.g. 75% of his time to the potential project.

Bill: Whatever funding is needed, it is the cost of Matthias' time?

Matthias and Hannes: His time is paid by taxes from Saxonian state. Use of Hodder is free to private individuals. But if we extend the service to other agencies we have a Software Licence Agreement running with Dedicon, and would have to extend that for other agencies. Most of the funding would need to be for Matthias' time, also for technical support, security of online service, documentation, support materials and so on. Matthias spends a lot of time trying to get feedback, so if he gets better feedback and documentation from others then he has more time to write code.

9 and 10. Collective Funding, Decision-Making, Development Planning and Next Steps (13.30-15.00)

Arne Kyrkjebø (NLB) and Sarah Morley Wilkins (DAISY)

Refer to file: 1. Arne & Sarah's Presentations 28-29.5.19 (PPT)

These final sessions were merged, and included a review of approaches to secure resources, project management, decision-making and an Agile development plan, with proposals and discussion for next steps.

Arne introduced this final session, in which he and Sarah presented the business angle. They had prepared some scenarios and proposals for how to move forward, and gave time for discussions. Some participants had left after lunch to catch flights: RNIB, DZB, Italian Library for the Blind.

Project background and premises

Arne presented slides 27-33 of Arne and Sarah's presentation, summarising the basis of this project and the issues/premises which have guided our decision-making so far, starting from the needs of libraries producing music braille but also appreciating the needs of individual blind musicians.

Now that we have developed Requirements (which is a great achievement in itself), Arne and Sarah propose that the solutions should include at least two alternatives, to reduce risk and to meet all user needs (e.g. production solution and individual users); have working software according to our requirements (probably both centralised and decentralized to work in different agencies), with maintenance and development (to keep it robust for the coming years), and support.

Future scenarios

Arne presented four scenarios for what could happen next depending on availability of further funding: 1 we could stop now if no further funding, as NLB has funded it so far, and Developers can do what they like with the Requirements. 2 Developers could make the improvements and we agree to buy licences. 3. We could establish a collaboration with developers with funding to build tools to our Requirements. Or 4 we build new tool/s and set up a new organization to run it.

Possible funding sources

Bill had given an indication of the kind of scale of development work for GoodFeel – which is not small fixes – it's a lot of work (and money) to meet the Requirements. Arne outlined possible funding sources, manufacturers, users, other sources. NLB has secured some funding from the Norwegian Association of the Blind Research Fund - around €30,000 (we asked for more, and were given the feedback that this is a great project, and they are open to giving more when we can show concrete development plans/outcomes). There are certainly other areas of funding like this which other people could apply for.

Arne described how a combination of different sources with an open collaborative project could work, and described what we would have to do to work as a collective fundraising and commissioning project, and compared different projects which had run recently and which have either a philanthropic basis, or VIP benefits.

We will need to know what agencies need so they can apply for funds for this, e.g. ONCE will want a concrete project – this is the tool we will build, this is what it will cost. For NLB, they have to settle plans in October for their budget planning cycle.

We agreed we would skip Slide 34 and return to it later.

Steering group

Sarah then presented slides 35-37 of Sarah and Arne's presentation, describing in more practical terms how we could run a collective development project. She first outlined how a small Steering Group (or Project Board) with a common interest could oversee the project, providing strategic direction and supporting the Project Manager, and their purpose and responsibilities: e.g. senior, high-level planning and decision-making, and responsible for fundraising and resource allocation. The project sponsor would be the chair with final decision-making authority.

Project Manager

The Project Manager would handle day-to-day activities, with exception reporting (e.g. Green, Amber, Red) against workpackages, milestones, risks, major changes to the Steering Group. Members should have strategic experience in e.g. resource planning and monitoring, tech-dev projects, fundraising. We'd also need testers – since most developers don't have an in-house testing team, but could involve world-wide testers, feedback collated by Project Manager, and sending a single response back to Developer.

A phased funded development model

A good funding-development model used elsewhere is that work is prioritised to get essential work underway and when enough funding is secured that work starts, whilst further fundraising happens to raise money for the next phase of development. Otherwise there is a risk that we might never get anything done if we wait to secure e.g. the whole 3-years of funding. The Steering Group and Project Manager would also support open communication with the sector, as in all DAISY projects. DAISY could handle the banking, issue contracts, financial reporting and auditing.

Agile technical development

We propose that this should be an Agile development project and Sarah outlined the strengths of this approach for a project of this kind. It's rapid and creative, with working software very frequently delivered with ongoing testing, and re-design if necessary – rather than waiting 12 months to realise the features don't do what you'd hoped, it's cost-effective. Agreed features are built in each delivery 'sprint' (e.g. a sprint could be every 2 weeks, 4 weeks, or 3 months), comprising some features which are trivial, small, medium and large, as resources permit. Need agencies to commit to funding this year, and/or next year, and/or year after so we know there is a continuous flow of funding.

Collective fundraising and commissioning

Back to slide 34: Collective fundraising and commissioning. What would we need - we'd need to know what we really want to specify for development – perhaps with the Steering Group and Developers, and what resources the Developers might need – might be cash, recruitment/secondment, back-filling, providing testers (worldwide). Agencies to apply for grants and make donations – could try to secure big grants, and collect smaller donations. Need to agree the development specification, contracts, progress reviews, and testing, promote the updated tools.

Discussion questions

Sarah then proposed some discussion questions (slide 38): is this the right kind of model? What benefits (if any) would funders require (or is it just to benefit the community?) What timeframe do agencies/funders work to? Do developers like the sound of this kind of model? How should we choose which tools to invest in? What volunteers are there to draw on for Steering Group, Testing Group, Braille issues, and metadata for file-sharing.

Questions/discussion

9a) Funding arrangements and opportunities?

George: DAISY is happy to manage the finances and so on, we've done that lots of times. Also, Marrakesh is new, and adds (at least in US law) support for music - we've never been able to do music under Copyright Exception before. We could get a global big win in the blindness world (e.g. through WBU etc), by promoting music in braille which can be distributed worldwide to all Marrakesh ratified countries – could really help with fundraising activities. Also, it's a fundamental way of sharing the files which many organisations hold

right now, which could be uploaded and added to collection(s) – needs a lot of thought – but could be really beneficial right away, e.g. ONCE resources could be available to any Spanish-speaking country.

Francisco: ONCE resources can in fact be shared to any country – not just useful for Spanish-speaking countries - music braille is universal, but the user must be able to read the format.

9b) Best way to build a repository of MusicXML and resulting output files?

George: Could the MusicXML file be made available too – could benefit the very large group of people who need large print music? Also could have a format for people with learning disabilities and dyslexia – e.g. for on-screen highlighting and tracking (as in Dancing Dots software). Could make major strides for a repository of materials for sharing world-wide – much of the end-product already exists in library collections.

Avneesh: At yesterday's ABC meeting, they reported they have more than 5,000 braille music scores in their repository, but not enough people are downloading them – don't know if there is an awareness issue among Authorized Entities (AEs) of the files (they download other stuff but music braille doesn't come up in search results), or maybe most agencies have already shared their files in other ways.

Francisco: Some AEs don't offer music braille to their users, and may be concentrating on developing their collections of literature/fiction. Also, AEs are doing the searches, not end-users.

George: Bookshare is ready to take music braille files from agencies. Can't take it from ABC. But agencies can give files to Bookshare to distribute.

Francisco: ABC also working on Business-to-Consumer (B to C) interface, so users can make their own searches, then places the order which goes to the AE to handle it and returns it to the user. So, some types of materials which are not widely used now may soon be.

George: Yes, ABC are working on this, some kind of Federated Search. But I think Bookshare would be ready sooner. Having the MusicXML, braille and large print music files would be great.

9c) The structure of other DAISY projects

Avneesh: Our ePub Checker Steering Committee has me on it, plus 2 from the publishing community and Project Manager. It has 3 project phases, to March, to December, to June next year. We started when Phase 1 funding was secure. Then the publishing community continued fundraising till we secured Phase 2 funding so Phase 2 could start. Phase 3 funding is not yet secured.

George: It started with a technical committee which shared a Request for Proposals (RP). Three proposals were received, one written by Avneesh and team, proposing development phases and cost. Their proposal was very clear and concrete as they had experience of this already. It's a good idea for the company who may be doing the work to bid for it with a price and a phased time and cost, so we know how much to fundraise. I like Hodder as a converter tool with no interactivity, though I have some concerns that it's only one-person developer. But we could specify that we need someone else to be trained, and/or documented. And a repository that the code is made available if someone else needs to take it on.

Avneesh: In a licencing model the Developer puts in the money and then sells. But here, we have small companies, so probably not possible. This is highly user focussed, and should be

easy to show benefits to blind people – good for funding bids. And if we can get Business to Consumers model (i.e. library to the consumer) asap (letting blind people get their own scores) we have an even greater chance of funding success (e.g. with World Blind Union). Business to Business (B2B) here refers to libraries to other libraries. Numbers of downloads is the evidence to provide for success measure. We branded the W3C ePub checker tool ‘Maintained by DAISY’ to keep the branding.

Avneesh: Bookshare is very good at marketing and promoting themselves and the service. Make sure when Bookshare is promoting this they also promote the DAISY stuff to benefit us and vice-versa.

George: The interactive piece is really important.

Sarah: Yes, so as per our proposal if we want a professional quality in-out solution, as well as the education/individual interactive tool, they’re probably different tools.

9d) What next?

Roger: I agree we’ll need a couple of tools as previously described. Can we have an understanding of what people in the room could offer in terms of support?

Sarah: We won’t put you all on the spot, but who could help and how? e.g. fundraising proposals, cash, donations in kind, secondments, technical help, testing, steering group, documentation, trialling getting files into Bookshare etc?

Roger: I and UK colleagues could help with (subject to approval):

- Testing
- Trying to establish (with ICEB) a proposal for unified braille music approach for both English, and non-speaking English countries.
- Trying to document the formats (the national music presentation layouts).

Sarah: the two different presentation styles (Section-By-Section and Bar-Over-Bar) have their own semantic structure, and you can’t easily switch between them, and there are lots of options for each layout between countries.

George: Good reason to have the MusicXML file available too, so they can create the format they want. The metadata should include the format so users know what they’re getting.

Haipeng: After the three developer presentations I have seen lots of differences and difficulties coming from different requirements. It’s impossible to fulfil all requirements at once in one package at this stage. Perhaps we should divide the development into several phases. E.g. we could make software to fulfil the basic and mostly used requirements, to e.g. Bar Over Bar, and Section by Section, to e.g. UK, North America and German presentations. Then in later development phases we can add other modules. Should ease the development process and save costs.

Haipeng: Some of the current problems are caused by the unclear descriptions of MusicXML. So, if we can solve the basic problems first, then when MNX is published we can make less effort and get better results, because MNX itself will solve lots of our problems - such as the system text, categorisation of various text and symbols, and some more semantic and unified descriptions of musical elements, e.g. so text placing and voicing more clear, making the braille transcription easier. After this we can continue the development. Then, if possible, we can use either BMML or make a semantic language which may be a mirror of MusicXML or MNX which stores braille information in it – this would also ease the braille transcription. I believe the semantic language should be the ultimate solution for

music braille transcription. If we just develop a thing like BMML we still may have lots of things to solve, rather than a new, clear, universally-used music braille format. Happy to hear others' opinions.

9e) Related areas of work

George: At the W3C in the Knowledge Domain, work is being done to identify where symbols are used to represent human knowledge, and a Chemistry Community Group is forming. Seen presentations with SVG which walk through a molecule visually, in auditory, and in braille – the industry is looking for ways to present visually complex and symbolic information. Could potentially be useful to us too – minimum of 3 years for this to come. George has put Sarah in touch with Janina, so we are all connected.

Bill: Please note that MNX is still on the drawing board. Although I agree it could be a wonderful thing to streamline and package MusicXML, but not sure when/if we'll get there – it's not a done deal. We may have to think about what we're going to do in the meantime.

Sarah: Yes, the feedback we got back from W3C when we submitted our requirements and detailed examples for MusicXML 3.2 improvements and for the new specification for MNX, they are working with us to get our requirements in, but MNX is several years away certainly, but MusicXML3.2 will be sooner.

Avneesh: Nothing happens immediately in the W3C; often takes 3 years.

George: And we shouldn't expect that browsers would take MusicXML /MNX file and present it in a browser. We've been looking for that for Maths for many years. But the SVG is a different approach, because the browser doesn't have to do anything other than show the SVG – all the info is inside the file.

Sarah: SVG = Scalable Vector Graphics. It's the same format that's been used for tactile graphics – you can emboss it and explore the tactile version on a touchpad, read it out loud, describe it, and has navigation

Bill: We (Dancing Dots) built something similar which we didn't yet commercialize – Music Touch – we have a video of it on our website, uses braille and a tactile tablet.

George: an advantage of thinking like this is it can be moved to phones and tablets – so I can envisage a tablet on a piano that a student could use instead of a computer.

9f) What do agencies see as the benefits in this project?

Arne: SBS has experience of music braille – staff, knowledge, existing solutions. What would SBS see the advantages of these proposals?

Manfred: It does look like we do need two different tools – one for those learning music braille, teaching and interactive, and the other for producing. I get the impression it could be an advantage for funding for two different things – for library/producers (e.g. institutions could pay towards this), but the end-user interactive tool solution could have licences, crowdfunding, maybe from end-users. SBS is more interested in the producing part of the tool, and if this improves what we do now, more automated, needs less hours and know-how, that's good. In some years we have several of our experts who will retire. We need to plan whether we need the same kinds of expertise, or musicians, or braille specialists. We'll need to know what tools are coming. And in the short term if we can agree that we can improve Hodder, then this will be advantageous to us as we use it anyway. We will always look at other tools to see if anything is better suited to us, but from what we've heard I don't see that we'd need to change from Hodder. SBS can offer to test everything, and we

can discuss some funding opportunities (from SBS or other institutions) for the production tool. SBS probably can't crowd-fund with end-users (not very many users in our small country).

Arne: Yes, longer-term planning of staffing and skills needed are all important for all of us.

9g) What info do agencies need and by when?

Francisco: Let's decide the scenario we want – are we going to improve a tool or tools, or start from scratch? Very different funds and efforts required. ONCE would need a concrete proposal for what we will develop and how much money we need for institutions to consider a contribution.

Sarah: When would you need to know?

Francisco and Manfred: Calendar year – planning in summer for spend from Jan 2020 (ONCE and Dedicon).

Sarah: So, that's what we'll work on in June/July!

George: Could also ask agencies to commit effort now from existing experienced braille producers to work on documentation, translations, braille issues etc, which doesn't require immediate cash.

Sarah: Agreed, in-kind contributions would be good for testing, documentation, finding sample and test materials, agree the specifications which are outstanding.

George: Also, contributing materials to the global repository.

Avneesh: Develop the project plan, and create a concrete project proposal for institutions.

Bill: In London I agreed we needed a workplan with numbers, which we've now done to show the costs. We are happy to negotiate the hourly rate, but if you multiply the hourly rate by estimated hours you have a budget. One of the great things Sarah's done is creating the prioritised requirements, so we could focus on the highest priority issues for your model of phases, while fundraising for the next phase.

Sarah: Yes, I'd asked the developers to prioritise the Essential, and Essential-Desirable items. The others are less vital for a robust, viable conversion programme but those features could be the cherry on the cake.

9h) Should we build on an existing tool or start from scratch, and what should we focus on first?

George: The interactive features we've been talking about – are they adding to an existing product, or having to start from scratch?

Sarah: We all believe we should only be concentrating on improving existing tools, rather than starting from scratch – so, that also answers Francisco's question about which scenario we should follow. Does everyone agree? Yes. These tools represent years and years of expertise we don't want to waste. New tools have been started, but fall by the wayside because this area is so complex, well-established and detailed. In terms of the interactive features, the tools from Italy (BME) and US (GoodFeel) both have those interactive features, it's only Hodder that doesn't. They have loads of interactive features to read, write and explore in different ways. The question for the steering group will be – do we try to improve both tools at the same time (production tool and interactive tool) or do out our money in one tool first, to get the improvements we want to see, and then start on the next one. We don't want to spread ourselves so thinly that we can't really make any improvements.

Avneesh: Yes, the Steering Committee would be making that decision. Let's start getting that together.

Sarah: We're asking for volunteers...

Roger: Could you approach people to form the Steering Committee? Invite them yourself, as people who put themselves forward might not be appropriate.

Avneesh: You can put out a Call for Participation seeking people.

Sarah: Great, I've already written a lot of this, so can I work with you to make sure it's compatible with other DAISY calls?

Avneesh: Yes. Shall we send it to the Board members?

Sarah: We should send it to the DAISY Board, and our own circulation list.

George: Ask for nominations, and then figure out who we can accept from those.

Sarah: Yes, will need a mix of skills.

9i) More requirements needed for an interactive tool

Manfred: One last remark – some questions in the Requirements survey were difficult to answer – for a production tools vs an interactive/user tool. If we have two tools then we might need two surveys to focus on those specifications.

Sarah: Agreed, the original Requirements/Survey was not supposed to be about an editing/interactive tool, though some questions did sneak in, grey areas. The Steering Group can work with the Project Manager to make sure the Requirements for each tool are more carefully specified, working with the contracted Developers, so they can be focussed on the specific tool in question.

9j) Tool sustainability

Arne: When we think about two tools, we can consider they cover two areas: either complementary – focussing on different areas, or reducing the risk. We should consider what would happen if one of those tools stops for any reason – we want to ensure these tools are available in 3 years time.

Sarah: And to ensure that the tools are sustainable in themselves and have the support they need.

9k) Thank you and close

Arne: Thank you all – some of you have travelled a long way for this meeting. It's been a good meeting. Hopefully the goal is not to have a fourth round table – the hope is to be more concrete. A lot of things have happened, and now the process can be more concrete to improve the issues. We will be in touch. Thank you to everyone for your presentations and participation.

Sarah: We won't meet again like this, certainly not in a room this nice. Thank you for responding to a lot all at once, and a lot of detailed responses required – thank you for your comprehensive replies. Nice to have talked face-to-face in this meeting.

Arne: Thank you to Sarah too. And although she's been diplomatic and talked about 'The Project Manager' we want her to be it.

And finally: The meeting room at WIPO and its amazing views over Geneva

