

DAISY Music Braille Project:

Requirements-capture survey for interactive user tools for music braille

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## Related documents

* **The Requirements Document** - a prioritised set of functional requirements for consideration by developers for inclusion in professional music braille conversion tools, based on our Requirements Survey: <https://dl.daisy.org/Findings_from_the_DAISY_Music_Braille_Conversion_Tool_Requirements_Survey_15.4.2019.docx>
* **The original Requirements Survey** for consultation, including the rationale for each proposed requirement: <https://dl.daisy.org/Requirements_Capture-Music_Braille_Conversion_Tools_11.2.19.docx>

# Introduction

## Vision

Blind braille-reading musicians enjoy timely and affordable access to increased numbers of accurate music braille scores in hard-copy and digital formats produced by effective and reliable conversion tools.

Additionally, blind musicians themselves have effective ways to convert, listen, explore, learn, edit and output music scores independently and in multi-media ways, with powerful, flexible and easy-to-use interactive tools.

## Mission

Through collaboration, we wish to achieve greater automation for music braille production, not just in production houses but also for personal use and for music education.

Existing interactive user tools which include music braille output offer greater interactivity and flexibility for exploring and customizing music in accessible ways than is necessary for agency production tools - but these tools also need improvements. These interactive tools can be used by blind students, amateur and professional musicians, blind transcribers, and sighted people supporting them.

In addition to securing at least one sustainable music braille production tool which is already underway, we also wish to secure the development of at least one sustainable interactive user tool. This kind of tool provides blind musicians with a user-friendly experience of converting, reading, exploring, editing and outputting music scores in braille as well as in multi-media ways: through sound, synthetic speech, embossed and refreshable braille, and in ink print. Transcribers can use the same tool to control the braille output required by blind students/musicians to maximise their learning and reading experience.

The tool will be supported by a robust business plan with a financial plan in place to ensure its sustainability (e.g. for at least 5 years) as well as providing support and maintenance services.

## This document

This Requirements-capture document sets out additional high-level functionality required in an interactive user tool for music braille. It also reminds readers of the features already prioritized for the professional music braille conversion tool which will also apply to the interactive user tool.

All these requirements were drawn from international surveys and Round Table meetings conducted by the DAISY Music Braille Project.

These features are those which agencies, transcribers, and end-users have reported that a tool should do in future, to make the converted braille music scores not only accurate and reliable and suitable for sharing, but giving additional multimedia features which enable blind musicians themselves to create and access music scores in various ways.

## Description of intended user

It is expected that the user of the interactive music braille tool(s) may include blind early learners just starting to learn music through braille, as well as more advanced blind music students, amateurs or professional musicians. The user may also be a blind or sighted music teacher or transcriber preparing music for their students or performers.

Users will therefore have a range of knowledge of music terminology and music braille, from very limited to proficient. They may be users of screen-access technology.

The resulting tool should accommodate all of these user types.

## Prioritisation

We are asking sector experts to comment on the proposed priorities for these new requirements, and propose alternative ranking if you don’t agree. So, for each new additional requirement please indicate whether you ‘Agree’, or ‘Disagree’ and if you Disagree, please tell us what ranking you think it should have and why, so please respond for each User Tool (UT) requirement as to whether you:

A) Agree or

D) Disagree: I suggest instead this feature is:

1 = Essential

2 = Desirable

3 = Nice to Have

4 = Not Needed

0 = No Opinion.

Please add your response wherever you find ‘**Your response:’** You only need to respond to the new User Tool (UT) requirements which have a UT number. You do not need to comment on the requirements from the original requirements which have already been prioritized by the sector, and are included here for completeness.

Bear in mind that it may not be possible to have everything on this list, and some requirements may not even be possible, so please prioritise your requirements carefully so the essential things become obvious.

We will review all responses, and seek to find the majority view, if not consensus. Responses from DAISY members may be weighted if we need a way to make final decisions.

As before, the resulting prioritised Requirements will then be shared with Developers, seeking their comments, and estimates for pricing and timeframe for implementation.

## How to respond - by 31 January 2020

Please email your completed document to: **sarah@sarahmorleywilkins.com**

by **Friday 31 January 2020.**

## Reference rule books

Throughout the document, reference is made to the two main rule books:

* NIM: New International Manual of Braille Music Notation
* MBC: Music Braille Code, Braille Authority of North America 2015

## Note on the numbering of features

New features specific to the Interactive User Tool are numbered starting with ‘UT’ to distinguish them from features in the original Requirements document.

# About you

We need to know who's replied to the survey, but don't worry, we're only going to use this information when we analyze the responses, not for anything else.

This is a DAISY Consortium project, and we treat all data with care. Your details will not be shared or used for any other purpose, in accordance with [DAISY's Privacy Policy](https://daisy.org/about-us/terms-and-conditions/privacy/).

**1. Country**
**Your response:**

**2. Email Address**

**Your response:**

**3. Name**

**Your response:**

**4. Are you responding on behalf of (a) your organization, or (b) as an individual?**

**Your response:**

**5. Your organization name (if applicable)**

**Your response:**

**6. What is your role/interest in this field?**

**Your response – please insert ‘Yes’ after any which apply to you:**

* Transcriber
* End-user of music braille
* Developer
* Music teacher
* Other (please specify):

# 1. Accessibility and Usability

## 1A) User Tool Requirements - proposed priorities

Please rate these:

* **UT 1.1:** When navigating through the musical score, it gives information in several levels, e.g. braille dots only, musical elements, or silent with only midi sounds for notes.
Why: To enable blind musicians to read, learn and explore the music score in various ways for different tasks.
* **Proposed priority:** Essential
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 1.2:** The verbosity of whole categories of symbols can be adjusted (e.g. for all dynamics, for all articulations, for all notes).
Why: New learners and proficient musicians require different amounts of verbal description (verbosity), and it is helpful to be able to apply global settings to groups of symbols at once.
* **Proposed priority:** Desirable
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 1.3:** A "play-along" function enables users to play the score by voice, part, bar or in different tempo, adjusting these options on-the-fly.
Why: To turn the music score into a multi-track player or Karaoke machine, letting blind musicians perform along with the score or analyze the score quickly.
* **Proposed priority:** Nice to have
* **Your response: Agree / Disagree – I think this is priority:**

## 1B) From Original Requirements Document – already prioritized by sector

(do not rate these features now)

**Essential**

* 1.2 Blind people rate it as easy to use with at least one of the main screen-access solutions (e.g. Jaws, NVDA, SuperNova).
* 1.4 When navigating through the digital score, it supports: Select, Go To, and Browse Next-Previous, by: note, voice, stave, system, print line, and braille line.

**Essential-Desirable**

* 1.3 The tool can be translated into other languages.

**Desirable-Essential**

* 1.1 Sighted users rate it as easy to learn and to use.

#

# 2. File handling

## 2A) User Tool Requirements - proposed priorities

Please rate these:

* **UT 2.1:** It handles and represents files in a fully accessible way, e.g. multimedia content such as print, braille, voice, midi…).
Why: To make the braille music scores and the software interactive, versatile and user friendly, capable of multi-media score representation and exploration.
* **Proposed priority:** Essential
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 2.2:** Add agreed metadata into the created file before sharing with online collection.
Why: So files can be easily found when searching in online collections and the origins of the file clearly indicated.
* **Proposed priority:** Desirable
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 2.3:** Be able to control both source (including MusicXML/MNX and related images/sounds) and braille in one project.
Why: To ease data handling for both transcription, navigating, editing, feature definition and debugging.
* **Proposed Priority:** Nice to Have
* **Your response: Agree / Disagree – I think this is priority:**

## 2B) From Original Requirements – already prioritized by sector

(do not rate these features now)

**Essential**

* 2.1 It can handle large files up to 100 MB.
* 2.2 It accepts the latest MusicXML or MNX input files, as well as older versions.
* 2.3 It can handle the full range of stave notation imports.

**Essential-Desirable**

* 2.4 It can accept a MusicXML file with an infinite number of parts, and the user should be able to select from any of those parts.
* 2.6 It is future-proof by allowing for the addition of agreed DAISY-defined new signs for special notation.
* 2.7 It accepts SMuFL specifications in the MusicXML file.
* 2.8 It allows users to specify the order of pieces in a volume, or over multiple volumes.
* 2.9 It can split a large file into several segments; and combine segments into a complete file/full score.

# 3. Formatting/Layouts

## 3A) User Tool Requirements - proposed priorities

No additional requirements for the interactive user tool.

## 3B) From Original Requirements – already prioritized by sector

(do not rate these features now)

**Essential**

* 3.1 Single Line.
* 3.2 Bar-Over-Bar, (with option for Line-Over Line).
* 3.3 Line-By-Line (Open Score).
* 3.4 Section-by-Section (with option for Stave-By-Stave).

# 4. Country Codes

## 4A) User Tool Requirements - proposed priorities

No additional requirements for the interactive user tool.

## 4B) From Original Requirements – already prioritized by sector

(do not rate these features now)

**Essential**

* 4.1 It can produce at least the main country codes: e.g. UK, USA, European *[to be specified].*

**Essential-Desirable**

* 4.2 It can handle multiple languages in one file.

# 5. Options

## 5A) User Tool Requirements - proposed priorities

Please rate these:

* **UT 5.1:** It can automatically or manually categorize texts and do additional braille formatting.
Why: To place or format texts in different types according to braille music convention. MNX has dedicated text categories, and MusicXML files which lack text categorization can also be marked (e.g. some tempo indications, titles of non-first movements, and stage directions, which are usually only labelled as <words>.
* **Proposed priority:** Essential
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 5.2:** It can redefine and restart print/braille page numbers and bar numbers.
Why: To deal with sources whose starting point is not at page 1 bar 1. This is often seen in score files split during engraving due to very different layout from section to section. The function enables blind users to get correct page and bar numbers, to communicate smoothly with their sighted teachers/peers.
* **Proposed priority:**Desirable
* **Your response: Agree / Disagree – I think this is priority:**

## 5B) From Original Requirements – already prioritized by sector

(do not rate these features now)

**Essential**

* 5.1.1 Fingering (on/off)
* 5.1.6 Bar numbers (on/off)
* 5.1.9 Define interval direction (specified)
* 5.1.14 Repeat handling (specified)
* 5.5 It can transcribe according to specific instrument types, so that the same symbol can be transcribed to appropriate braille equivalents.

**Essential - Desirable**

* 5.1 The tool permits options to show/hide features in particular layouts to suit different user needs, e.g. for learners, or those learning the score in a particular way
* 5.1.2 Print line numbers (on/off)
* 5.1.4 Position of braille page number (specified)
* 5.1.8 Print page numbers (on/off)
* 5.1.12 Paper size (specified)
* 5.1.13 Doubling convention (specified)
* 5.1.15 Transpose a single part/voice (specified)
* 5.1.16 Rehearsal letters (on/off)
* 5.1.18 Octave signs at the start of each line (on/off)
* 5.1.19 Lyrics (contracted/uncontracted)
* 5.1.20 Braille page number (on/off)
* 5.4 When editing, it can automatically move objects in a braille staff or system, like modifying texts in MS Word or Duxbury Braille Translator.

**Desirable - Essential**

* 5.1.7 Bar number location (side/top)
* 5.1.10 Indentation (specified)
* 5.1.11 Hide empty staves (on/off)
* 5.1.17 Position of rehearsal letters (specified)
* 5.2 User profiles (configurations and definitions) can be saved for users with different requirements.
* 5.3 It can provide dynamic on-screen visual and braille music notation.

**Desirable - Nice to Have**

* 5.1.3 Position of print page number (specified)
* 5.1.21 Running header (on/off)

## 5C) Additional suggestions (to be prioritized)

Please rate these:

* **UT 5.3** Essential: *[from a music teacher and end-user]* Need settings for in-accords or moving notes, and options for choir music handling, options for e.g. interval signs but not lyrics…
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 5.4** Essential: *[from a transcriber and music teacher]* Embellishments; dynamics; tempo; prefixes for shaped notes; nuances; ornaments ... (on/off).
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 5.5** Essential: *[from a transcriber, end-user, and music teacher]* Chord symbols; accents; dynamics; sixteenth groupings - on/off for all those features.
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 5.6** Essential: *[from a transcriber and end-user]* Lots more options, e.g. show/hide clef signs, nuances, ornaments, dynamics/expressions - options to strip a score down right from the complete score, through to just the notes. Also: whether to show every bar number; how many bars are shown per section; whether the number sign (numeric indicator) is shown for bar numbers or not; what kind of slur sign is used (simple C, or phrase 56-B, or both)…
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 5.7** Essential: [from a transcriber, end-user, and music teacher] Many other items to include in the section about fingering, for instance, slurs, ornaments, dynamics.
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 5.8** Desirable: [from an end-user] Switching between interfaces in different languages.
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 5.9** Desirable: [from an end-user, developer, and music-teacher] Options should permit production of a score of nothing but pitch, octave, and duration through facsimile score.
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 5.10** Desirable: [from a transcriber] For a song with several verses with the same melody, have on/off option for writing out the print music repeat…
* **Your response: Agree / Disagree – I think this is priority:**

# 6. Conversion of Musical Symbols

## 6A) User Tool Requirements - proposed priorities

No additional requirements for the interactive user tool.

## 6B) From Original Requirements – already prioritized by sector

(do not rate these features now)

**Essential**

* 6.1 Accents are correctly converted, according to NIM and MBC.
* 6.2 Supports both types of breath marks, according to NIM and MBC.
* 6.3 Chord symbols are accurately translated according to NIM and MBC.
* 6.4 It presents clefs accurately, according to NIM and MBC.
* 6.5 It converts dynamics appropriately, whether written as symbols or words, or combinations, following NIM and MBC.
* 6.6 It converts fingering for keyboard, string instruments (right and left hands) appropriately, according to NIM and MBC.
* 6.7 Markings for strings are correctly translated according to NIM and MBC.
* 6.8 Grouping/beaming of notes is converted correctly according to NIM and MBC rules.
* 6.9 In-accord signs are handled correctly, following NIM and MBC for various situations.
* 6.11 Long and short-value signs are presented, and whether a bar in 4/4 begins with a semiquaver, following NIM and MBC rules.
* 6.12 Vocal music conversions confirm to NIM and MBC.
* 6.13 Unison signs are correctly used, showing two or more parts on the same note.
* 6.14 Tremolos are translated appropriately, as per NIM and MBC. E.g. repetition, alternation and doubling of note repetition signs.
* 6.15 Time signatures are correctly translated, even if they are not numeric.
* 6.16 Ties are presented so they are distinguishable from each other: single note, chord tie, accumulating tie/arpeggios.
* 6.17 It can present stem signs.
* 6.18 Different kinds of slurs are presented accurately.
* 6.20 Ornaments are correctly translated, following NIM and MBC rules.
* 6.21 Octave signs are correctly presented following NIM and MBC rules.
* 6.22 Nuances are correctly presented.
* 6.27 It combines musical symbols in the right order.
* 6.28 Multiple Bars' rest are presented in a compact manner, following NIM and MBC rules.
* 6.29 It handles bars appropriately…

**Essential-Desirable**

* 6.10 Instrument names are correctly presented according to language, and where instrument names change within a single part, the translation is correct.
* 6.19 Prefixes for shaped notes are correctly translated according to the most usual symbols.
* 6.23 It can present Tablature (notation indicating instrument fingering rather than musical pitches) following the agreed specification.
* 6.25 It can present Figured Bass following NIM rules.
* 6.26 In ensemble scores, it can control part names flexibly…

## 6C) Additional suggestions (to be prioritized)

Please rate these:

* **UT 6.1** Essential**:** *From a transcriber and end-user:* Essential to have correct braille code within word expressions in the music (may well be different from the code used for lyrics in the same music)…
* **Your response: Agree / Disagree – I think this is priority:**

# 7. Output

## 7A) User Tool Requirements - proposed priorities

No additional requirements for the interactive user tool.

## 7B) From Original Requirements – prioritized by sector

(do not rate these features now)

**Essential**

* 7.1 Conversion generates an e.g. >80% error-free success rate when an agreed range of samples is tested *[to be specified]*
* 7.2 It either: generates output which can be compiled in a braille editor as part of a production workflow; or can handle mixed text-music files entirely.
* 7.3 It can output the full range of stave notation (single line, vocal (including multi-voice), keyboard, full score, lead sheet, continuo part, all standard instrument-specific articulation and other techniques).
* 7.4 It can extract parts from, e.g. chamber music or orchestral scores.
* 7.5 Outputs a file suitable for embossing (e.g. BRF, BRL (text file) format).
* 7.7 Outputs an eBraille/Text file [in BRL text format] for use on a refreshable braille display.
* 7.10 It notifies the user of conversion progress, success or failure.

**Essential-Desirable**

* 7.8 Outputs a printable file of stave notation.

**Desirable-Essential**

* 7.6 It can reformat Bar-Over-Bar material using different braille page sizes [to be defined].

## 7C) Additional suggestions (to be prioritized)

Please rate these:

* **UT 7.1** *From a developer*: Make dynamic conversions in real time depending on the needs of the user, which will change during use of the score…
* **Your response: I think this is priority:**
* **UT 7.2** *From an end-user*: Unicode braille is the future, like in normal digital text. For us the potential is even more because it also covers music notation.
* **Your response: I think this is priority:**
* **UT 7.3** *From a transcriber and music teacher*: Use Unicode for braille (in contrast to musical symbols), to avoid, or better solve the different language codes, Essential.
* **Your response: I think this is priority:**
* **UT 7.4** *From a developer*: Generate and play the sound-representation of each musical event in parallel with the Braille representation…
* **Your response: I think this is priority:**
* **UT 7.5** *From an end-user*: MIDI playback to allow users to check their work by listening, Essential.
* **Your response: I think this is priority:**
* **UT 7.6** *From a transcriber and end-user*: Develop APIs for other transcription software to call the music transcription tool as a subprocess.
* **Your response: I think this is priority:**

# 8. System Requirements

## 8A) User Tool Requirements - proposed priorities

Please rate these:

* **UT 8.1:** Must have built-in screen-access, or work with a low-cost/free screenreader.
Why: to allow easy independent use by the greatest number of users, even those on a low budget.
* **Proposed priority:** Essential
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 8.2:** It can be installed (or at least used) on both regular computers and the most popular braille notetakers.
Why: To let blind musicians read, learn, listen to and edit braille music scores using their portable braille devices.
* **Proposed priority:** Desirable
* **Your response: Agree / Disagree – I think this is priority:**
* **UT 8.3:** It can also be installed (or at least used) on a mobile device running Apple or Android.
Why: To enable blind musicians to navigate and listen to music scores using these devices.
* **Proposed priority:** Nice to have
* **Your response: Agree / Disagree – I think this is priority:**

## 8B) From Original Requirements – already prioritized by sector

(do not rate these features now)

**Essential**

* 8.2 It must be programmed in such a way that it can be further developed.

**Not ranked**

* 8.1 If installed locally, it must work with XX technology, and uses no more than 2GB RAM even for the most complex files. *[minimum specification to be defined].*

## 8C) Additional suggestions (to be prioritized)

Please rate this:

* **UT 8.4** *From a developer*: The program should be portable to all (PC/Mac/Android...) platforms.
* **Your response: I think this is priority:**

# 9. Business Arrangements

## 9A) User Tool Requirements - proposed priorities

No additional requirements for the interactive user tool.

## 9B) From Original Requirements – already prioritized by sector

(do not rate these features now)

**Essential**

* 9.4 Operate a system for reporting bugs, issues and requests, and for sharing updates on implementation.

**Essential-Desirable**

* 9.1 Annual service level agreement available to secure fixes and support *[define an acceptable response time for support questions]*
* 9.3 Offer the service for a minimum term, e.g. 5 years *[to be defined].*

## 9C) Additional suggestions (to be prioritized)

Please rate these:

* **UT 9.1** *From an end-user:*Be available both as a trial version (as for example a 30-day-demo) and as a full version.
* **Your response: I think this is priority:**
* **UT 9.2** *From a music teacher:*Have a cut down version without so many options for beginner users…
* **Your response: I think this is priority:**
* **UT 9.3** *From an end-user:*Documentation; user manuals, quickstart guides, keyboard shortcut lists, should be available in a range of accessible formats; HTML, plain text, BRF, ...
* **Your response: I think this is priority:**

* **UT 9.4** *From a transcriber and developer*:Feedback, because things do not get better without feedback.
* **Your response: I think this is priority:**
* **UT 9.5** *From an end-user and music teacher*:Need a database for scores produced, as world wide as possible, so we avoid all the double productions we have now.
* **Your response: I think this is priority:**
* **UT 9.6** *From a transcriber and end-user:*Clearly document the system.
* **Your response: I think this is priority:**

# 10. Note about Funding

## 10A) User Tool Requirements - proposed priorities

No additional requirements for the interactive user tool.

## 10B) From Original Requirements – already prioritized by sector

(do not rate these features now)

**Essential-Desirable**

* 10.1 The sector should aim to secure the future of a tool, or tools, which together support both agency production as well as education.

# 11. Anything else?

Please tell us if there is anything you would like to see in these Requirements – ideally written in a similar way please:

Issue:

Why:

Priority:

# Thank you!

Thank you for sharing your expertise to help prioritise these additional Requirements for interactive music braille user tools. We will share the final requirements with developers (as we did with requirements for the Production Tool) and keep you updated with responses and progress.

If you have influence over funds in your organisation, please be ready to engage with the financing process for this development.

Thank you very much for your participation.

Sarah Morley Wilkins, Arne Kyrkjebø and Haipeng Hu.

DAISY Music Braille Project