



Figurenotes Music Notation Software

Development Brief





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<https://www.figurenotes.org>

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1. Introduction

Drake Music Scotland is inviting tenders for the creation of a user-friendly, digital application that will deliver its music training platform processes from start to finish.

Background

Figurenotes© is a music notation system designed in Finland by Kaarlo Uusitalo, further developed for music teaching purposes with Markku Kaikkonen. The software is an accessible notation programme that enables the user to create and print full-colour music scores based on Figurenotes© notation.

It represents the features and characteristics of Figurenotes© and has the same purpose: to enable people of any age to learn to play musical instruments and read music. The software is aimed at teachers and students, including those with Additional Support Needs.

It is used to teach music to people before they learn to read standard notation. It uses colour and shape to identify the musical elements of pitch and duration and is based on the ability to match identical symbols.

Each musical note has a corresponding Figurenotes© symbol. Players match the colour and shape of the note they see in the score to a sticker on their instrument, or a taught finger pattern, and simply 'play what they see'.

Figurenotes© conveys the same musical information as standard notation. Progressive stages of transition create a developmental pathway towards reading standard notation.

The software and its approach to learning has great benefit, such as:

- Increased engagement
- Better focus and concentration
- Improved behaviour
- Access to music education and the ability to progress
- Inclusive – allowing everyone to play together, regardless of their stage of reading.
- Intuitive – makes music notation make sense. No longer abstract.
- Gives a form of expression to those that may not have a release

2. About Drake Music Scotland

Drake Music Scotland is the nation's leading arts organisation providing music making opportunities for people with disabilities. Our expertise in inclusive music technology and specialist teaching methods support people of all ages and a wide range of disabilities to play, learn and compose music independently.

Developing out of the Drake Research Project founded in England by Adele Drake in 1988, Drake Music Scotland became a separate charitable organisation (Registered Scottish Charity No. SC026908) in 1997 and since then has worked with over 13,000 children and adults across Scotland.

Our biggest achievements to date include setting up All Join In our flagship education programme for special and mainstream schools, implementation of our acclaimed training and CPD programme, our innovative developments in technology, and the introduction of Figurenotes.

Further background can be found at: <https://drakemusicscotland.org>



3. The Requirement

The Current Platform

Currently, Figurenotes is offered to users as a stand-alone application that can be purchased and downloaded online. The software registration keys are managed by Drake Music Scotland, and other support materials are provided for teachers via the Figurenotes online shop.

The platform is established and used by many music tutors currently.

The platform supports the learning process, delivers MIDI sound and allows for creation, saving and export of musical projects. It is a simple drag-and-drop system, easy of use and accessibility are important.

The Limitations

The current framework and its continued improvement can often be hampered because it is a compiled application. The delivery of updates and improvements requires improvement to allow the effective growth and adoption across the userbase.

More people expect their services to be available online and on their devices. Currently Figurenotes is only available as a desktop application for Windows and Apple Mac.

Software support, while minimal since the applications is well established, requires a rebuild of the whole application then delivery to all users, and subsequent reinstallation, which is often an inconvenience.

The Required Solution

Drake Music Scotland require a port of their existing Figurenotes application to a web-based service, that fully delivers the existing functions and provides required and suggested improvements to help deliver and continually grow the learning facility to a wider audience.

Figurenotes© Software promotes inclusion across the spectrum of music-making opportunities and differentiation within them.

The required web-based application will allow a worldwide user-group to create, compose, playback, print, and share scores. The ability to access Figurenotes© Software and files anywhere via an internet connection will allow a diverse range of people to access music and encourage collaboration.

The Application

The current application will be made available to interested tender parties for evaluation. It is recommended that the application is reviewed in full, we expect there to be some improvements, but do not expect any functions to be deprecated; a solid understanding of the existing platform is important in understanding the requirement of this tender.

User Interface

A responsive design for use on tablets, phones, laptops, and other displays is required.

Usability is paramount. Functions must be clear and easy to access, but without overwhelming the user. ASN (Additional Support Needs) must be taken into full consideration. All suggestions of layout and design should be treated as an initial starting point only, while the current platform is established, we welcome design and usability improvements.

Accessibility will comply with Web Content Accessibility Guidelines (WCAG).

- Minimal Text
- Clear Graphics
- Uncluttered screen
- Ability to enlarge
- Must work with screen readers
- Option to adapt notes for colour-blindness - e.g. diagonal lines in 2 directions to be used to distinguish between notes or alternative colours.
- Possible use of inverted screen colours or B/W support

The GUI will be simple and streamlined, to encourage focus. To minimise text on the main screen, graphic symbols or icons will be used as the primary communication tool to demonstrate each function, supported by text where appropriate.

Colour combinations within the GUI are crucial. We prefer a soft, light grey for the background, as we find it interferes the least with the Figurenotes colours, as well as avoiding the glaring white screen that can cause sensory problems.

The score should have a drop-shadow to make it the focus of the page.

Special consideration is required to ensure that menus are clear and easily accessible. In-line help should be obvious and the supporting videos (currently hosted on the Figurenotes website) should be made available to users at no more than a few clicks.

The main purpose of the GUI will be to ensure that all functions are available with little effort, simplicity is essential.

Users should be able to create, print scores and playback instantly.

Desired: To build their scores using their keyboard or connected MIDI controller

The web platform should deliver a new section, a saved song library; an area where users can browse their saved songs, and control how they are saved and indexed (by class or student for example).

Desired: This song library could link in with a new online hub. See link in tender.

Accessibility & Browser

It is important that the service is accessible. The tender should include your plan for ensuring that the GUI is useable and supports screen-readers where possible.

We understand that some browsers may not fully support the proposed system. We welcome suggestions and guidance on approach to browser support.

We prefer that the system is available on all common browsers but expect there will be limitations on some platforms.

Sound Support

The platform should offer support for MIDI, at minimum GM 1 sound-set, dependant of course on the platform of the user.

The requirement is simple, so at this point we only require simple play, instrument selection and triggering of MIDI sounds with sustain, we do not require full MIDI expressions or modulation control signals to be edited or triggered for example.

Care should be taken to limit latency where possible.

Each Figurenotes© symbol has a direct relationship to a sound.

MIDI will work in 2 ways within the Figurenotes© Software:

- Inputting notes - the note will sound as you click it
- Playback - MIDI sounds will playback the score accurately when requested

Desired: The user keyboard can be used for triggering sounds

Desired: A MIDI controller (e.g. a MIDI keyboard) can be connected and used to input notes in two ways:

- *A steady beat (metronome) will enable a part to be accurately inputted by playing in time.*
- *Step Input Recording: One beat notes can be entered by pressing the appropriate key on the keyboard. This will appear in the next available space in the score/where the cursor is, adjusting length of note with the mouse within the software or sustain possibly recorded from note hold time.*

During playback, different instrument sounds can be used for different parts in the score. Piano will be the default sound, except for percussion parts, where it will be drum kit as default.

Notes should only sustain as written in the score, with no lag or extra sustain. Accurate playback is vital.

Chords will sound as a root position triad - I, III, V

When using the Playback feature, the cursor should follow the beats. This helps the user follow the score.

Desired: A switchable highlight feature that would change the colour of the bar being played.

File Types

Saving and importing of files is important, users should be given the function to save unlimited songs to the GUI song library, but also import and export.

Moving to the new web platform will create an issue where existing users may lose their existing saved pieces. The system should allow for the import of existing pieces and saving to the user library.

Figurenotes has its own file type (FGN). This is an XML file. The web platform must be able to save and import seamlessly using this format.

In addition, we would like to save into:

- PDF
- MIDI
- XML
- MXML

Functions

It is recommended that the software is used to allow the tenderer to become acquainted with the required functions. If you require access, please email figurenotes@drakemusicscotland.org stating your operating system.

The required functions are:

Score Setup

When opening a new score, a pop-up box appears to aid setup. This will include the following:

- Option to open file instead of creating new one
- Number of beats in a bar (default 4, choice 1-16)
- Optional upbeat - added to the left of the first full bar
- How many bars per line (default 4)
- Title/Composer
- Stage 1 and 2

Desired: Stage 3 and 4

Score type:

- How many parts - (8+)
- Part type - Melody/Chord/Percussion (default Melody)
- Title, Composer

Access to all these options available through menus too.

Can double-click on the dotted title space at the top of the page to get the pop-up box back again (See Appendix 1)

Input and Editing Notes

Palette area (See Appendix 1) containing all-natural notes and blank notes of all shapes

Keyboard containing all-natural notes with symbols on but can also input from the black keys. Black keys are defaulted as the most commonly used: C#, Eb, F#, G#, Bb

Desired: Palette options can include:

- *Pentatonic (choose starting note)*
- *Custom (select notes)*
- *Common keys, meaning #s and bs are included in palette*

Ways to input notes

- Drag and drop
- Double-click to add to next available space after cursor
- Set the length of note and then double click (default 1 beat)

Desired:

- *Set the length of note and keyboard shortcuts for pitch (default 1 beat and closest to last entered note)*
- *A MIDI controller can be used to input notes, using a metronome beat for precise input of rhythm.*

Default note length is 1 beat. Length of note can be changed by 3 methods:

- Keyboard Shortcuts (1-8 for number of whole beats, W for whole bar, Q for quaver, S for semiquaver)
- Graphic buttons to add quavers (make the note longer), or remove semiquavers (make the note shorter)
- Keyboard shortcuts to do the incremental method above (shift + left and right arrows)

Ability to add arrows for #s and bs.

- Could either be a pitch shifting option - up/down in semitones - or drag an arrow onto a note to add

2 options for notes that span bar line

- Note tail continues for as many beats as the sustain lasts (default in 1st and 2nd stages)
- Ties are used, as in standard notation

Shortcut to repeat previous note pitch and length (R)

Ability to select sections/groups of notes to copy and paste/transpose (change pitch)/move

Must be able to jump by semitone and by interval - with options

Ability to 'nudge' a note left and right, if it isn't in the right place

Ability to add notes in triplet form (3 beats in space of 2 beats)

Ability to add repeat marks, first and second time bars, and various bar lines - see also in 'Expression'

Desired: Ability to stack notes in all instrument parts.

Chords

- Can choose to create a chord part during Score Setup
- Note input is the same as melody part
- Ability to change chord to minor or added 7 (major is default)
- Sharps and Flats shown within chord box (see appendix)
- Make sure additional shapes within chord box can fit within a crotchet beat with no overlapping of other chords.
- Ability to hide the additional shapes within the chord box.
- Can show just root note outer box for those playing 1 note chords
- Can show just the 3rd (when accidental is needed)
- Can show 3rd and 5th

Percussion

Can choose to create a percussion part during Score Setup

3 lines (do not need to be named)

- Bottom - Squares
- Middle - Circles
- Top - Crosses

Desired: Ability to switch to four lines in percussion (middle two lines are circles)

Stage 2 to have five lines as standard notation.

Default sound is drum kit (See Appendix 2)

Time Signature

Set time signature at very start in Score Setup

If changing time signature for the whole piece, after notes have been entered, the notes will be rewritten to fit

Include simple and compound times, with beat markers set accordingly (e.g. 4/4 will be split into 4 crotchet beats. 12/8 will be split into 4 dotted crotchet beats. Big beat markers, plus the division in quavers in lighter, dashed line)

Desired:

- *Ability to change time signature mid-piece*
- *Option to display time signature in score*

Expression

Ability to add different bar lines (e.g. repeat, end piece, *first and 2nd time bars*)

Desired: Ability to add musical symbols to a note (e.g. accents)

- *Shortcuts*
- *Palette to choose from*
- *Ability to add music symbols to a series of notes, linked (e.g. slur, crescendo, etc.)*

This option would be hidden from main screen as default, but palette can be chosen from the menu, with the ability to add it into screen layout.

Adding Text & Images

Ability to add text anywhere on the score via text boxes

Tie text boxes to notes, so if note moves, so does the text

Space/Text box for 2nd verse, if required, at the bottom of the score

Ability to add numbers above notes for fingering - must be tied to notes

Ability to edit text easily

Ability to add image anywhere in the score - this allows users to add any symbols we don't have in the software, as well as pictures of instruments and people for accessibility (i.e. instructions with no text)

Adding Lyrics

- Add lyrics to score from selected note
- Lyrics tied to note
- Length of note will limit lyric space available
- Can move each lyric slightly in editing to avoid overlapping
- Hyphen or spacebar takes cursor to next note when writing lyrics
- Option to hide lyrics

- Option to override space-limiting feature. This allows user to write instructions or make small adjustments to squeeze in extra letters

Desired: Option to add multiple lyrics to one note (mainly useful in a chord part)

Stages (Progression)

- Figurenotes 1st Stage – each part in a single line (except percussion)
- Figurenotes 2nd Stage– each part on 5 lines (stave)
- Ability to switch between stages with one click

Desired:

- *All 4 stages of Figurenotes notation within one programme (See Appendix 1)*
- *Figurenotes 3rd Stage – Standard notation but note-heads are Figurenotes shapes and colours. Use standard rhythm e.g. coloured outline of shape for minim.*
- *Figurenotes 4th Stage – Standard notation with coloured note-heads in Figurenotes colours*
- *3rd Stage to have clear black outlines for each coloured note-head*
- *3rd Stage note-heads to be as large as possible without interrupting placement*
- *3rd Stage symbols to remain in black – e.g. sharps/flats*

Import / Export / Saving

- MIDI
- XML
- MXML
- Must be able to import/export more than one part at once

Desired: When importing, separate the two staves of a piano part into two separate Figurenotes parts.

Save As:

- FGN
- PDF
- MIDI
- XML
- MXML

Ability to extract parts – Save score or parts

Automatically input 'Title' text as file name

Print from screen

Page preview with zoom feature

Export to PDFs to be printed later

Beat Markers

Every beat in the bar is clearly marked (See Appendix 1)

- Bar lines - solid line
- Main beats e.g. crotchets- dotted line
- Sub-divisions e.g. quavers - faint dotted line

Must be present in 1st and 2nd stages

Playback

Playback options in toolbar and menu

- Playback from beginning
- Playback from selected bar
- Stop
- Pause

Ability to mute parts

Ability to solo parts

Ability to select the desired MIDI sounds for each part

MIDI sounds incorporated into software - see MIDI section 2.4

Note Names

- Option to add note names (A, B, C etc.) in the centre of the Figurenotes symbols
- Option to use note names including #s and bs (Bb, F#, etc.) depending on direction of Figurenotes arrow added to Figurenotes symbols
- Option to use German system (H instead of B)
- Option to add Solfege (Do, Re, Mi etc.) instead of letters
- Must be able to choose which note is 'Do' - default as C

Editable Layout

- Can add/delete selected bar(s) anywhere in the score, not just the end
- Can change size of notes/piece - increase/decrease
- Can change size of text - increase/decrease
- Can change how many bars per line
- Can choose to fit on one page or more

- Can change margins
- Can centre the piece on the page with one click (upbeats need to be taken into consideration)
- Edit space between parts or between lines of the score

Accessibility

- Minimal text
- Clear graphics
- Ability to enlarge and zoom
- Must work with screen readers
- In 3rd and 4th stage – keep all bars the same size to avoid the confusion caused by small bars with a semibreve and big bars full of quavers.
- Must work with smartboards and projectors
- Shortcuts - see below

Desired: Option to adapt for colour blindness, by adding diagonal line through one of the colours. Could offer 2 diagonal lines, one in each direction, to distinguish 2 notes.

Shortcuts

- Shortcuts for altering duration and pitch of each note.
- Keyboard and swipe shortcuts
- For any double-digit shortcuts, there must be an option for lock keys
- Navigation within the music should be possible using just the keyboard
- Input for notes using keyboard, such as A, B, C, and 1, 2, 3, 4 etc.

4. Considerations

The contracts will be managed by Drake Music Scotland.

All works, data and source code will be the IP and owned by Drake Music Scotland. In the event of developers wishing to use their own existing code, a perpetual licence for use may be granted to Drake Music Scotland. The ownership of such existing code will then remain with the creator.

The Contract Manager:

Rebecca Di Rollo/Lauren Clay

Drake Music Scotland, SPACE, 11 Harewood Road, Edinburgh, EH16 4NT

figurenotes@drakemusicscotland.org

0131 659 4766

It is anticipated that the contractor will establish the scope for the delivery of this project.

There will be a User Reference Group of staff to consult with. Drake Music Scotland will establish this group.

Questions should be submitted 1 week prior to tender close.

Tender close date is 9am 31/05/2021

The adoption of the new system will require different levels of training, via different media for different users. This should be identified.

Contractor output and timescales should be identified, as well as a project plan.

The successful contractor will preferably have:

- Experience of developing user-friendly, online applications
- Knowledge and experience of music software
- Understanding of the context faced by charity and social agencies
- C++ knowledge (original code is written in C++)
- Experience of coding programming languages/frameworks compatible with browser-based software
- A minimum of 2 years' experience in software development

Submission Requirements

- A demonstration of your understanding of the brief.
- Explanation of programming language/framework choices
- A detailed methodology indicating the number of days proposed for each task by each member of the team.
- An outline project plan, including review points

- Details of approach to quality assurance (including adherence to timescales and the quality of key outputs) and any relevant procedures/accreditation and how these will be applied to this project.
- Details of personnel who will undertake the work, giving particulars of experience and skills, including any sub-contractors you intend to use.
- At least two examples of previous work that you feel display the skills you would bring to this project. These should not include examples of work previously done for Drake Music Scotland.
- How you will deal with data protection, accessibility, information governance and security systems
- Risk assessment and mitigation that includes those risks associated with most application development projects, as well as those particularly relevant to this piece of work
- An accurate breakdown of all costs including daily rates and expenses and any VAT applicable, including VAT relating to subcontractors
- Ongoing costs to run application, including any technical support costs.

Tenders will be assessed for their value-for-money and on the following criteria:

Understanding of the requirements – demonstrates a clear understanding of the requirements of the contract and digital applications, including appreciation of the challenges and how they may be mitigated (25%).

Methodology - there is a clear methodology for the development and delivery of the application (20%)

Experience – appropriate staffing and expertise relevant to Drake Music Scotland requirements (30%).

Data & Accessibility – demonstrates an adequate consideration of data protection, information governance and security systems (10%).

Costs/value for money – there is an accurate breakdown of costs, including identification of ongoing costs (15%).

Tenderers should be aware that if a tender is judged unsatisfactory on any of the criteria listed above, it may be ruled out of further consideration.

Drake Music Scotland reserves the right to accept a tender other than the lowest tender or not to accept any tender at all and will not be liable for the costs incurred in the preparation of tenders.

Budget

Potential contractors are invited to quote a maximum project budget, inclusive of VAT, based on the methodology requirements above. Payment will be in stages and these should be suggested in the proposal.

Project Phases

The project will be reviewed after each development phase is complete. Each party will have the opportunity to review prior to proceeding onto the next phase.

Phase 1

- A successful clone/build of the existing stand-alone application into a web-based application that fully delivers the existing Figurenotes Stage 1 and 2 functions.
- Include MIDI concept proofing and successful build of stand-alone MIDI playback functionality.
- Include function that allows data to be read with screen readers
- System security testing
- Review and setup of hosting platform
- Build testing throughout

Note: Currently written in C++, so front-end needs to be rewritten. Includes access to assets.

Phase 2

- Successful move from single user to multi-user application
- Include successful build of sign-in & security mechanism
- Build of licence and user payments with successful integration of resource base
- Addition of desired functions based on function priority list

Phase 3

- Successful build of MIDI and keyboard input functionality

- A MIDI controller (e.g. a MIDI keyboard) can be connected and used to input notes in two ways:
- A steady beat (metronome) will enable a part to be accurately inputted by playing in time.
- Step Input Recording: One beat notes can be entered by pressing the appropriate key on the keyboard. This will appear in the next available space in the score/where the cursor is, adjusting length of note with the mouse within the software or sustain possibly recorded from note hold time.
- Addition of remaining desired functions based on priority list

Desired Functionality Priority List

1. Figurenotes 4th Stage functionality – Standard notation with coloured note-heads in Figurenotes colours
2. Ability to change time signature mid-piece
3. Option to display time signature in score
4. Ability to add musical symbols to a note (e.g. accents) via Shortcuts and Palette to choose from
5. Ability to add music symbols to a series of notes, linked (e.g. slur, crescendo, etc.) This option would be hidden from main screen as default, but palette can be chosen from the menu, with the ability to add it into screen layout.
6. Option to add multiple lyrics to one note (mainly useful in a chord part)
7. Option for Keyboard Palette options to include: Pentatonic (choose starting note), Custom (select notes) and Common keys, meaning #s and bs are included in palette
8. Set the length of note and keyboard shortcuts for pitch (default 1 beat and closest to last entered note)
9. Figurenotes 3rd Stage – Standard notation but note-heads are Figurenotes shapes and colours. Use standard rhythm e.g. coloured outline of shape for minim.
10. 3rd Stage to have clear black outlines for each coloured note-head
11. 3rd Stage note-heads to be as large as possible without interrupting placement
12. 3rd Stage symbols to remain in black – e.g. sharps/flats
13. A switchable highlight feature that would change the colour of the bar being played

5. Appendix

1.

The screenshot displays a music software interface titled "Screen grab.fgn". The top menu bar includes options like New, Open, Save, Print, Undo, Redo, Cut, Copy, Paste, Delete, Add Part, Remove Part, Add Bar, Remove Bar, Play, From Bar, Stop, and a Tempo control set to 102. Below the menu is a piano keyboard graphic with colored markers. The main workspace shows a score for the song "It's Good to be Me" with staves for Piano, Chords, and Drums. A "Page Setup" dialog box is open, showing fields for Title, Composer, Copyright, Watermark, and Page Numbers, along with Font Size settings and Page Orientation options (Portrait and Landscape). The software logo "drake Music Scotland" is visible in the bottom right corner.

Screen grab.fgn

New Open Save Print Undo Redo Cut Copy Paste Delete Add Part Remove Part Add Bar Remove Bar Play From Bar Stop 102 Tempo

It's Good to be Me

Piano

Chords

Drums

Pitch

Nudge Left Nudge Right

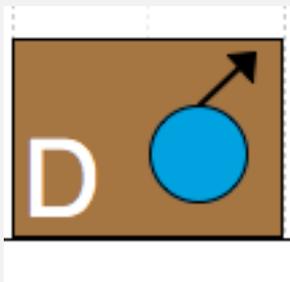
Note Length

Image Scale

Lyric Scale

Lyric Position

Drake Music Scotland



2.

Screen grab.fgn

New Open Save Print Undo Redo Cut Copy Paste Delete Add Part Remove Part Add Bar Remove Bar Play From Bar Stop 102 Tempo

It's Good to be Me

Edit part information

Part name Show lyrics in part

Part type

Melody part

Chord part

Percussion part

Clef type

Treble clef

Bass clef

Move part up

Move part down

Bright Acoustic Piano

MIDI channel

Piano

Chords

Drums

Pitch

Nudge Left Nudge Right

Note Length

Image Scale

Lyric Scale

Lyric Position

Drake Music Scotland

