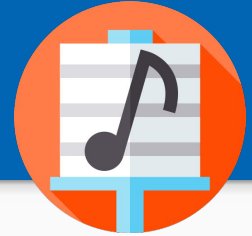


Building a Comprehensive Sheet Music Library Application



Digitization of Sheet Music



- Many aspects of our live have become digital in the last decades
- Music scores have become digital in many aspects too:
 - Software for typesetting beautiful music scores (MuseScore, Finale, Sibelius, Dorico)
 - Software for digitizing paper-based music scores
 - Digital libraries for accessing a large number of music scores
- But musicians have no consistent and easy access to completely digital (encoded) scores

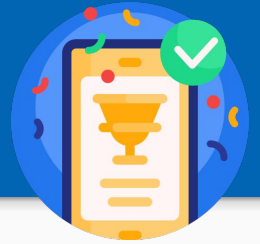
Our vision of Digital Sheet Music



Building a digital solution for musicians that can replace paper-based music scores has been attempted before but was often on par or inferior to paper-based music:

- Solution might not give access to the piece one is looking for
- Music scores do not meet the required quality standards
- Solution lacks essential features, such as the possibility to quickly navigate and easily annotate the scores

Our vision of Digital Sheet Music



A digital solution that can replace paper-based scores must:

- Be accessible and easy to use
- Give access to the music scores that the musician wants to perform
- Provide the same or more features than paper-based music scores

Enote: Intelligent Sheet Music



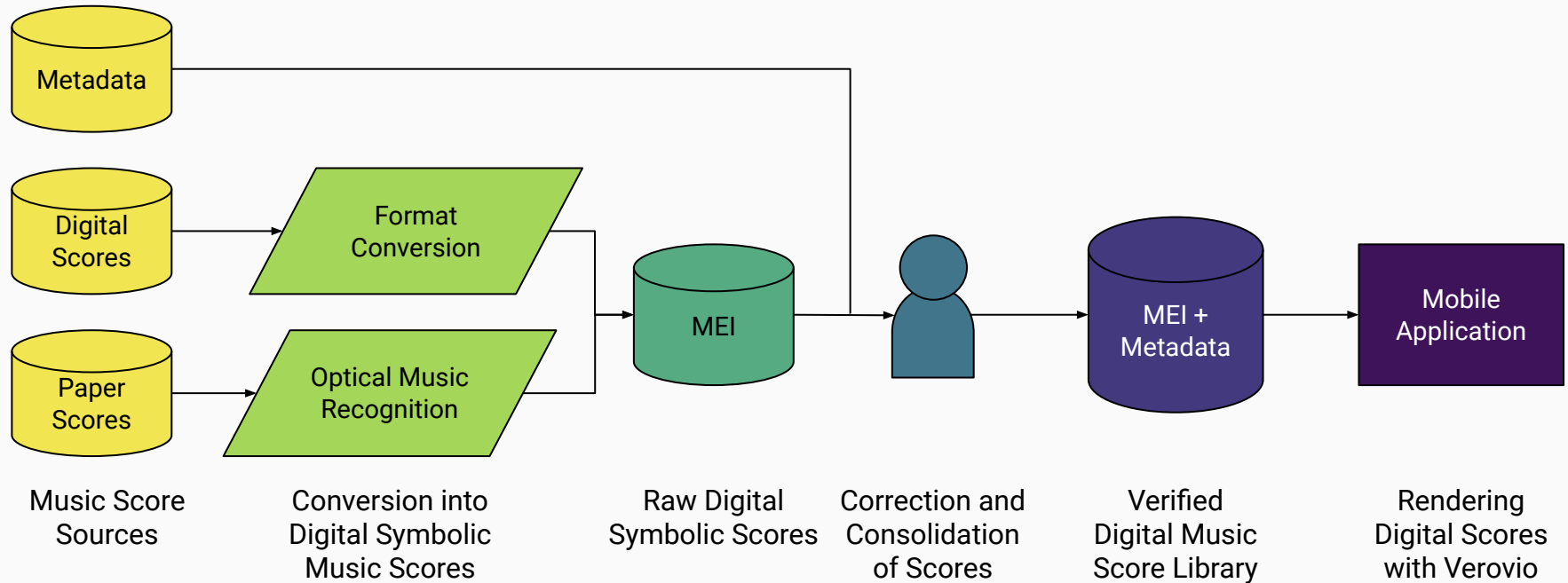
To fully unlock the potential of digital symbolic music scores, the company Enote was founded in 2018.

- Founders: Boian Videnoff, Josef Tufan, Evgeny Mitichkin
- Based in Berlin
- Currently around 40 employees

Our product at this stage:

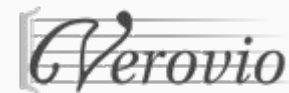
- Mobile iOS Application for displaying digital symbolic music scores
- Access to a growing number of pieces
- Rich set of features (search, navigation, smart annotations, ...)

Digitization Efforts



Presenting Scores

- We store our music encoded as MEI (MEI.cmn)
- We render our music with Verovio
 - Verovio is open-source software
 - Integrates extremely well into iOS development
 - Verovio is really fast
 - Natural choice to engrave MEI files



Building tools around MEI



- Merging files
- Applying our House style, e.g.
 - combining rests in part into multi-measure rests
 - unified rules for fermatas and tempo markings
 - expand beamed tremolos
- Extracting parts
- Giving back to the community:
We plan to open source parts of this later on!

Legato music font



- Developed for Enote's legacy style
- Based on Steinberg's Bravura
- SMuFL-compliant
- FOSS (OFL-1.1)
- Already available on GitHub

Improving Verovio

In order to make Verovio the gold standard for music engraving we contribute to its development:

- improve code
- add new features
- add missing glyphs to Verovio's own standard font (Leipzig)
- building a partnership between commercial and academic projects



Improving Verovio

- Beams with mixed stem directions
- Improved automatic engraving of cross-staff slurs

See the full list of contributions in the change log on [GitHub](#).

35

This image shows a musical score snippet starting at measure 35. The score is written for piano in G major (one sharp). It consists of two staves: a treble clef staff and a bass clef staff. The music features a complex rhythmic pattern with beams connecting notes across the two staves. A slur is drawn over the notes in the treble staff, extending across the staff boundary into the bass staff. The original engraving shows some irregularities in the beam directions and the placement of the slur.

35

This image shows the same musical score snippet as above, but with improved automatic engraving. The beams now have consistent stem directions, and the cross-staff slur is more clearly defined and correctly positioned, demonstrating the improvement in the software's engraving capabilities.

Summary and Outlook



Solution that unlocks the full potential of digital symbolic sheet music:

- Collecting and digitizing thousands of music scores with their metadata
- Offering mobile application that can replace paper-based music scores
- Preserving our cultural heritage by making it more accessible

Coming up next:

- Score editor
- More platforms (macOS desktop, Android)
- Automatic page-turning
- Virtual playback

Icon Credits

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