# Music Notation, MusicXML and W3C

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#### Types of Music Representation

- Two main types of music data file formats:
  - Audio: A recording of a music performance, as in CDs and MP3 files
  - Symbolic: Underlying musical data (pitches, rhythms) as in MIDI
- Music notation is most effectively represented on computers using symbolic formats
- Modern formats start with musical semantics, then adds details about appearance and playback
- Cannot "reverse engineer" notation from an audio file



### **Example: Original Finale File**

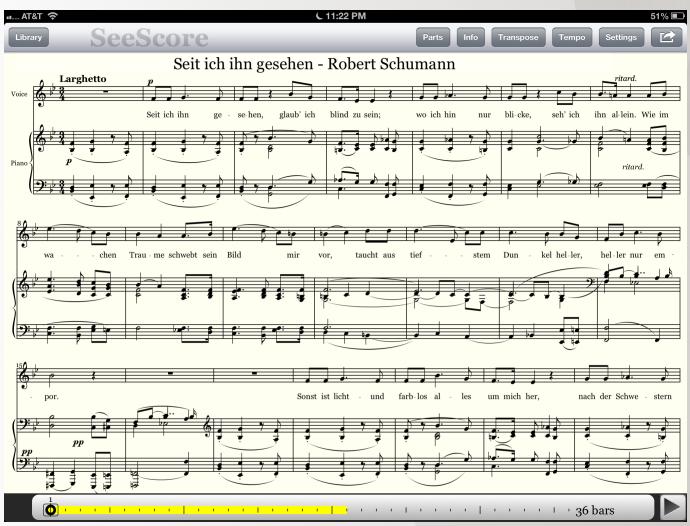
FRAUENLIEBE UND LEBEN, Op. 42

#### 1. Seit ich ihn gesehen





#### **Example: Reflowed in SeeScore**





#### What is MusicXML?

- The open, de-facto standard format for exchanging digital sheet music between applications
- Invented by Michael Good at Recordare in 2000
- Developed collaboratively by a community of hundreds of musicians and software developers over the past 14 years
- Available under an open, royalty-free license that is friendly for both open-source and proprietary software
- Supported by over 180 applications worldwide
- More information at www.musicxml.com



## Who Uses MusicXML

Usage map as of October 2014

#### **Products Shipping Now**

**Braille Music Editor Calligra Suite** capella Capriccio Cubase **Electric Pipes** Encore **Ensemble Composer** Finale (inc. NotePad. PrintMusic, SongWriter) Forte **FreeClef Guitar Pro Harmony Assistant iComposer JFugue** Lime

MagicScore

**Music Notation SDK** 

MusEdit MuseScore

music21 MusicXML Library

AudioScore Ultimate **Audiveris** Cadencii capella-scan capella wave kit Django HarmonyWiz Impro-Visor iReal Pro **JMSL Logic Pro** Ludwig Melomics muscript MvScript Music SDK **Notation Composer** 

**Notation Switchblade** 

**Archivarius 3000 Auto-Tune EFX 2 Avid Scorch BarFly** Blackbinder capella playAlong capella start **CsoundAC** Denemo **EarMaster EasyABC** Expresseur Frescobaldi **GUIDO** Harmonia Igor Engraver **INScore Jellynote KlavarScript** Kooplet Legato LilyPond MelodicMatch NotateMe NoteAbility Pro Noteflight Noteworthy Composer Notion Nuendo

Notion Nuendo Obtiv Octava OpenMusic Open Score Format Pizzicato PriMus

Progression ProxyMusic QuickScore Elite Level II SCORE

Score Perfect Professional Scorio Sibelius / Sibelius First

SmartScore Songs2See Editor Speech Analyzer Symphony Pro TaBazar

TablEdit VocalEasel

Opusmodus
PDFtoMusic Pro
PhotoScore Ultimate
Plaine and Easie
Rosegarden
Rousseau
Samplitude / Sequoia
ScoreCloud
Score Creator
ScoreMaker
SharpEye
SmartScore NoteReader

SONAR Symphonix Evolution Synfire Pro

tonica fugata TuxGuitar Melody Assistant / Player

**Mobile Music Trainer** Mozart MusicEase **Myriad Music Plug-in** Myriad QuickLook Plug-in **OrganMuse** Overture **OveScore Personal Composer PhonicScore PianoLudic Pocket Jamz Score Writer** SeeScore / SeeScore SDK Singer's Mate Songs2See Game Soundslice

**TEFpad / TEFview** 

teoría

**THoTH** 

xml2abc

**Beta/Prototype Software** 

**Audimus Notes** 

Haskell Library Humdrum KGuitar MusicSQL Nightingale Notelist Ossia Viewer Ptolemaic pyScore Zong! Editor

M

u

S

C

abc4j
Amadeus
BUZZle
Crescendo
FOMUS
jChing
MaxScore
mercussion
Middle C
mingus
Overture
Power Tab
PWGL
Song Builder

abc2xml

Antescofo Arduino **BrailleMUSE Canorus** CrestMuse Toolkit **FreeDots** GLozart **GStreamer HTML5 Guitar Tab Player** MATLAB **MuseBook Score** Musicista musicxml2mid musicxml2words MusicXML to MP3 **MXMLiszt** neoScores Opus **Philomelos PSAM Control Library Quantified Artist** 

**Zong! Webviewer Server** 



#### Publishing Scores in MusicXML

- MusicXML is the way that scores get from desktop applications like Finale and Sibelius to the new wave of mobile applications
- No DRM controls built-in, though these have been added in the MusicXML-based Open Score Format
- For copyrighted music, MusicXML has usually been a Business-to-Business format, not Business-to-Consumer
- Many sites available with public domain MusicXML scores: see www.musicxml.com/music-in-musicxml





## in MusicXML (1 of 3)

```
<part id="P1">
 <measure implicit="yes" number="0" width="179">
  <attributes>
   <divisions>24</divisions>
   <key>
     <fifths>3</fifths>
     <mode>major</mode>
   </key>
   <time>
     <br/><br/>beats>2</beats>
     <br/><beat-type>4</beat-type>
   </time>
   <clef>
     <sign>G</sign>
     line>2</line>
   </clef>
  </attributes>
```





### in MusicXML (2 of 3)

```
<direction placement="above" directive="yes">
 <direction-type>
   <words default-y="25" font-size="10.5"</pre>
    font-weight="bold">Nicht schnell</words>
 </direction-type>
 <sound tempo="42"/>
</direction>
<direction placement="above">
 <direction-type>
   <dynamics default-y="10" relative-x="-5">
    </dynamics>
 </direction-type>
 <sound dynamics="54"/>
</direction>
```



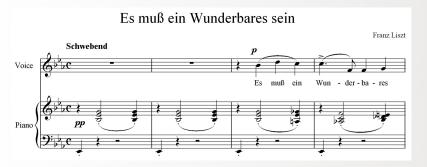


### in MusicXML (3 of 3)

```
<note default-x="141">
  <pitch>
   <step>C</step>
   <alter>1</alter>
   <octave>5</octave>
   </pitch>
   <duration>12</duration>
   <voice>1</voice>
   <type>eighth</type>
   <stem default-y="-50">down</stem>
   <lyric default-y="-80" number="1">
    <syllabic>single</syllabic>
    <text>Aus</text>
   </lyric>
 </note>
</measure>
```



#### Sibelius to Finale: MusicXML vs MIDI



Original as entered into Sibelius



Imported into Finale via MIDI



Imported into Finale via MusicXML



#### Why a Standards Organization?

- Always planned that MusicXML would eventually transfer from a company to a standards organization when mature, like PDF did
- Music notation industry is unstable: every significant player has had changes in ownership or direction in past 2 years
- Need to maintain the format to better support the industry's transition from printed to digital sheet music
- However, standards organizations have a dismal history with music notation over the past 20 years



# Music Notation Standards Landscape

- ISO / IEC Already has unused SMDL standard
- MPEG Already has unused MPEG 7 SMR standard
- IEEE Already has unused IEEE 1599 standard
- MMA / AMEI Home of related MIDI standards
- W3C Home of related Web standards
- Nothing yet the size of the MusicXML community
  - MMA and W3C have one notation company each
  - Notation standards developed outside of the music industry remain unused



### Staying in Touch

- MusicXML forum: <a href="http://forums.makemusic.com">http://forums.makemusic.com</a>
- Shows: Musikmesse, NAMM, SF MusicTech
- Twitter: @MusicXML
- Facebook: <u>www.facebook.com/MusicXML</u>

