Preservation of Non-Western Music Heritage through Digital Encoding

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Background

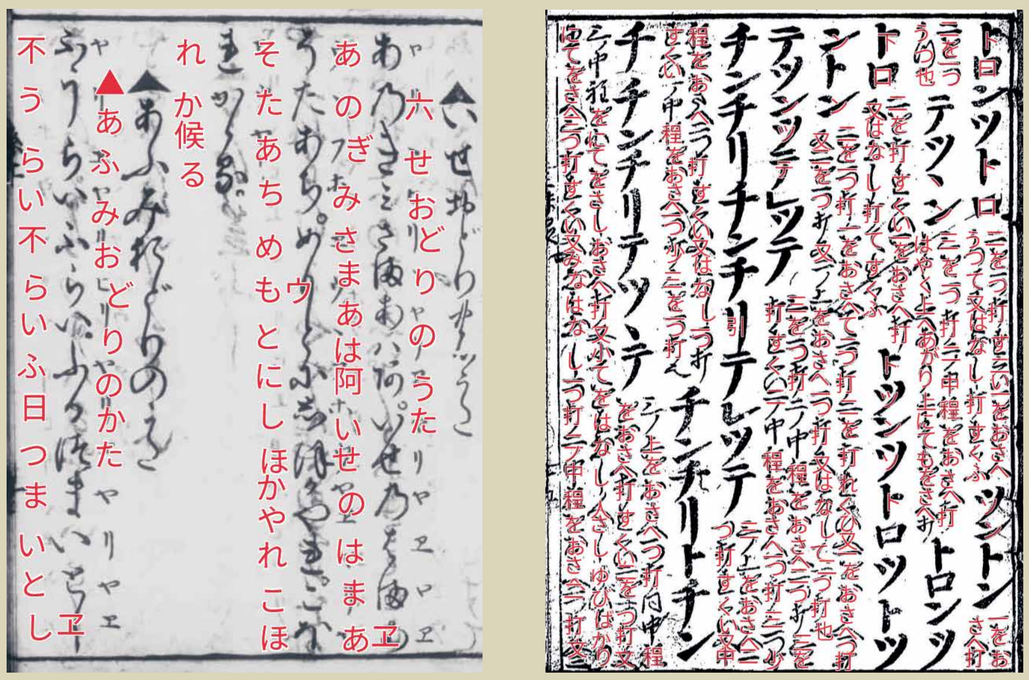
Digital preservation of musical materials is an important means of meeting the conflicting demands of long-term preservation and accessibility of materials. In particular, the preservation of musical materials in machine-readable form is essential for the advancement of informatics knowledge and computer-assisted music research. While machine-readability of musical materials is rapidly advancing in Western music, a similar approach for Japan and other non-Western musical cultures requires consideration of methods for machine-readable representation of musical notation, which differs significantly from staff notation.

Benefits of Non-Western Music Encoding

Brings in potential users who do not understand the traditional notation.
Correlates textual information with musical information.
Integrates multiple sources related to a single piece of music.

Work Flow

Transcribe Japanese kana and kanji in scores



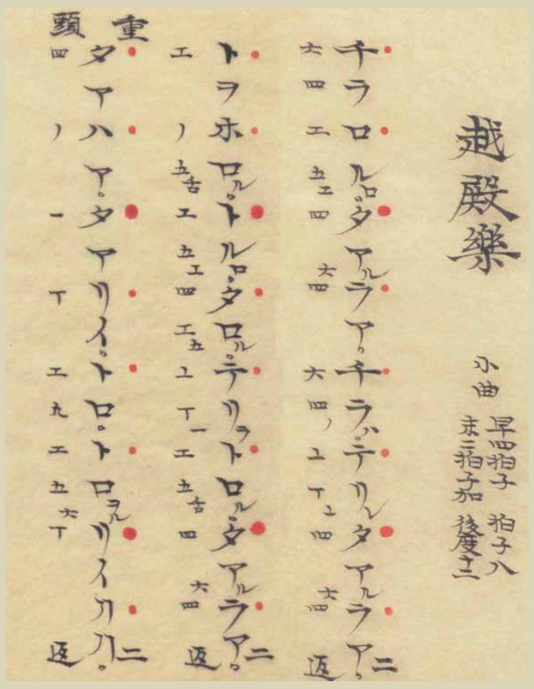
Extract text information with OCR (KuroNet) [1]
(Sheet music for Hitoyogiri(left)[2] and sheet music for Shamisen(right)[3])

2. Extract the musical structure described in the score

The operation of the instrument (fingering and position) is relatively described in detail.
On the other hand, note length and rhythm cannot be determined in most cases.

3. Encode in machine-readable format (TEI, MEI or MusicXML)

Staff-based formats often fail to accommodate the uniqueness of traditional music notation.
On the other hand, creating a completely proprietary format is too expensive to maintain.
It is necessary to find a way to minimize missing information while still using existing formats.



```
<measure xml:id="h22">
    <staff n="1">
        <layer n="1">
            <note xml:id="p54" dur="2" oct="4" pname="b" />
            <note xml:id="p55" dur="4" oct="4" pname="a" />
            <note xml:id="p56" dur="8" oct="4" pname="a" />
            <note xml:id="p57" dur="8" oct="5" pname="d" />
        </layer>
    </staff>
</measure>
```

```
<hyoshi type="small" xml:id="h22">
    <cell xml:id="c43">
        <pair xml:id="p54">
            <shoga type="large" xml:id="s54">ト</shoga>
            <tetsuke type="large" xml:id="t54">工</tetsuke>
        </pair>
    </cell>
    <cell xml:id="c44">
        <pair xml:id="p55">
            <shoga type="large" xml:id="s55">ロ</shoga>
            <tetsuke type="large" xml:id="t55">五</tetsuke>
        </pair>
        <pair xml:id="p56">
            <shoga type="small" xml:id="s56">ヲ</shoga>
            <tetsuke type="hide" xml:id="t56">五</tetsuke>
        </pair>
        <pair xml:id="p57">
            <shoga type="small" xml:id="s57">ル</shoga>
            <tetsuke type="small" xml:id="t57">六</tetsuke>
        </pair>
    </cell>
```

Sheet music for Hichiriki (Gagaku) [4] and its encoding [5]

Issues Facing Traditional Music

Decrease in the number of score users

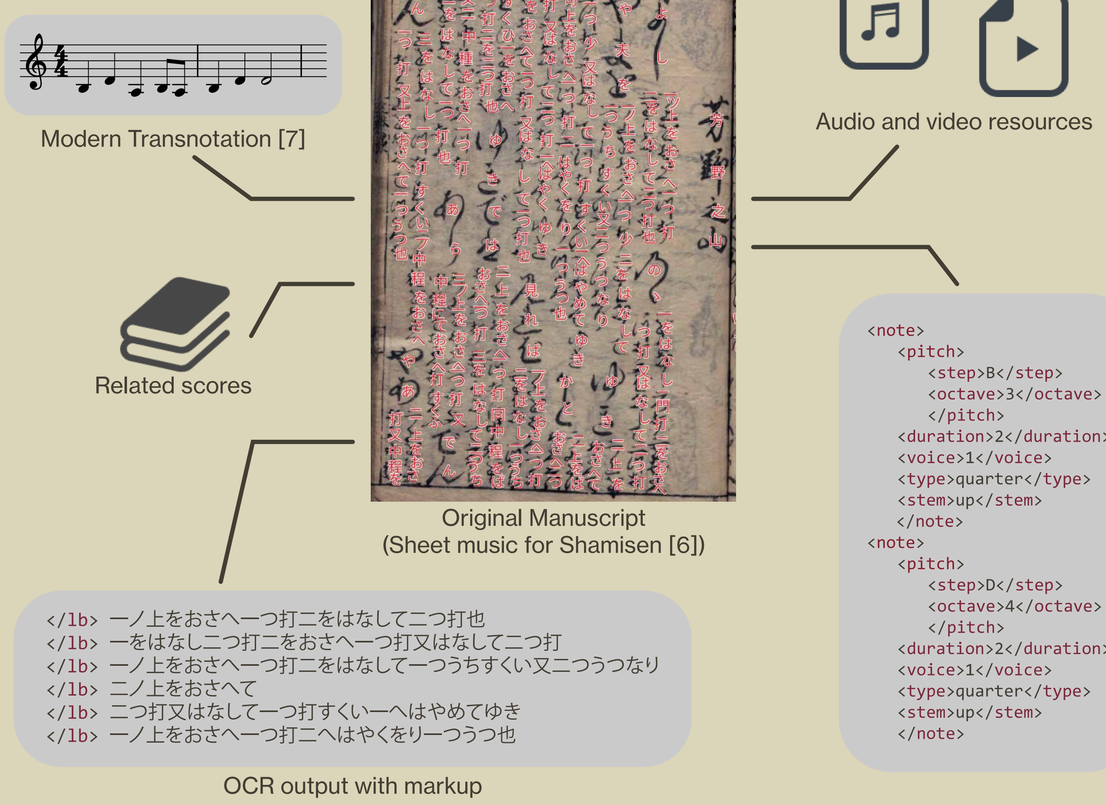
Although digital images of Japanese traditional music-related resources are gradually being made available to the public, few people have the literacy to read traditional notation, which is totally different from staff notation. Encoding music scores can increase the number of potential users and increase the availability of materials.

Low retrievability

The low findability is a result of the materials' inadequate distribution and organization. Without an in-depth understanding of the materials, it is challenging to locate the items that are needed. Encoding music scores improves the searchability of materials and enhances usability.

Future Outlook

Linking multiple documents and resources related to a single piece of music can further enhance findability and lead to new insights.



OCR output with markup

Reference

[1] KuroNet (AI OCR). http://codh.rois.ac.jp/kuronet/

[2] Shichiku Shoshinshū(糸竹初心集). 1664. Tokyo Metropolitan Central Library, Japan. DOI:10.20730/100012713.

[3] Oonusa (大怒佐). 1699. General Library in the University of Tokyo, Japan. https://iiif.dl.itc.u-tokyo.ac.jp/repo/s/katei/document/d371fff0-8b6d-42da-bfb9-112cf4beac11

[4] Gagakufu (雅楽譜). Tokyo University of the Arts. University Library, Japan. DOI: 10.20730/100376839.

[5] Shintaro Seki. 2023. *Encoding Traditional Court Music and Dance Scores Using the Music Encoding Initiative.* Encoding Cultures Joint MEC and TEI Conference, September 4-8, 2023, Paderborn University, Germany. DOI: 10.17613/t8ye-2j89.

[6] Shichiku-taizen (糸竹大全). cc. 1684-1688. Tokyo University of the Arts. University Library, Japan. DOI: 10.20730/100376749.

[7] Itsumi Kato. 2009. *Popular Songs for Hitoyogiri-Shakuhachi at the Beginning of the Edo Period.* Journal of Nagoya Management Junior College 50. 名古屋経営短期大学学会, Nagoya, Japan. DOI: 10.14995/00000310.

This work was supported by JSPS KAKENHI Grant Number JP23KJ0393